THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—44TH YEAR SYDNEY, SATURDAY, JUNE 8, 1957 No. 23

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— Page

Homage to Harvey, by K. F. Russell 777
Bronchitis, Asthma and Emphysema in Childhood, by Alan Williams 781
Ætiology and Diagnosis of Bronchial Asthma, Bronchitis and Emphysema in Children, by Stanley Williams 782
Treatment of the Asthmatic Child, by Ivan Maxwell 783
Spontaneous Rupture of the Œsophagus, by Harry M. Windsor and Ross M. Dunn 784

REPORTS OF CASES—

Eosinophilic Infiltration of Stomach and Small Intestine, by Thomas Ferrier, M.B., B.S., M.R.A.C.P., and Neville Davis, M.B., B.S., F.R.C.S. 789
An Unusual Abdominal Injury, by Eric M. Fisher .. 791
Lymphosarcoma of the Ovary, by A. R. H. Duggan 792
Fungal Endocarditis Complicating Staphylococcal Endocarditis, by N. J. Nicolaides 793

REVIEWS—

Adrenal Function in Infants and Children 796
Communicable Diseases 796
Rehabilitation of a Child's Eyes 797
The Year Book of Drug Therapy 797
Preventive Medicine and Public Health 797
Diseases of the Heart and Circulation 797
Functions of Autonomic Transmitters 798
Children's Eye Problems 798

BOOKS RECEIVED 798

LEADING ARTICLES—

William Harvey: 1578-1657 799

CURRENT COMMENT—

Some Pioneers of Cardiology 800
Joseph Black and the Discovery of Carbon Dioxide 801
A New Approach to Embryology 802
Metabolic Stimulation by Salicylate 802
Meprobamate Addiction 803
Temporal Arteritis 803
Dumb-Bell Tumours of the Parotid Gland 803

ABSTRACTS FROM MEDICAL LITERATURE—

Pædiatrics 804
Orthopædic Surgery 804

SPECIAL ARTICLE—

Medical Effects of the Atomic Bomb in Japan 806

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific 807

OUT OF THE PAST 809

CORRESPONDENCE—

Fat Intake and Coronary Disease 809
The Medical Profession and the Plight of the Aborigines 810

CORRESPONDENCE— Page

The Treatment of Orchitis in Mumps 810
Hepatitis 810
A "Silent" Strangulated Hernia 810
Guiaicol-Glycerol-Ether: A Tranquillizing Drug .. 811

OBITUARY—

William Eugene Downey 811
Edward Spencer Holloway 811
Robert Grant 812

NAVAL, MILITARY AND AIR FORCE—

Appointments 812

MEDICAL PRIZES—

The American Dermatological Association, Incorporated 813

POST-GRADUATE WORK—

The Post-Graduate Committee in Medicine in the University of Sydney 813

THE COLLEGE OF RADIOLOGISTS OF AUSTRALASIA—

The Thomas Baker Memorial Fellowship for Radiologists 813
Faculty of Radiologists of Great Britain 814

RESEARCH—

Experimental Research into Problems of Aging .. 814

CONGRESSES—

World Congress of Gastroenterology 814

NOTICE—

Q.T. Australia 814

THE ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS—

Wunderly Travelling Scholarship in Thoracic Disease 814
Grants for Medical Research 815

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS—

Final Fellowship Examination 815

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA 815

AUSTRALIAN MEDICAL BOARD PROCEEDINGS—

New South Wales 815
Tasmania 816

MEDICAL APPOINTMENTS 816

NOMINATIONS AND ELECTIONS 816

DEATHS 816

DIARY FOR THE MONTH 816

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 816

EDITORIAL NOTICES 816

HOMAGE TO HARVEY.[1]

By K. F. RUSSELL,
Melbourne.

ON June 3 we commemorated the tercentenary of the death of William Harvey, whose name will always be enshrined in the history of medicine. Probably no other person of his age is better known today; indeed, few gained such a reputation in their lifetimes as did Harvey. So soon after his death as 1668, Francesco Redi (1625-1698) called him *"quel grandissimo Filosofo de' nostri tempi, l'immortale Guglielmo Arveo"*. Other authors, in similar flights of hyperbole, have named him the greatest physiologist or the greatest biologist of all time. Harvey was none of these and would have been the first to refute such statements. He was, in fact, a painstaking, methodical physician and anatomist, who proved that a circulation of the blood existed in man and animals by carefully worked out experiments which were simple, clear cut, conclusive and backed by shrewd common sense. Therein lay Harvey's greatness and the reason why we pay him homage so long after his death.

Harvey was born on April 1, 1578, to Joan Harvey, the wife of Thomas, an alderman at Folkestone, and was the eldest of a "week of sons" and two daughters. His education commenced at King's School, Canterbury, and on May 31, 1593, he was admitted to Caius College, Cambridge, where he took his degree of bachelor of arts in 1597. The next year saw him in Padua, where he went to study medicine, and there he graduated doctor of medicine on Thursday, April 25, 1602.

On his return to London, Harvey wasted no time in having his degree confirmed at Cambridge, which was a necessary preliminary to being admitted a candidate of the College of Physicians; this was done on October 5, 1604. Three years later, on June 5, 1607, he was elected a Fellow of the College, and commenced his long association with Saint Bartholomew's Hospital.

August 4, 1615, was a notable day in Harvey's life, for it was on that day that he was appointed Lumleian Lecturer at the College of Physicians, a position he occupied until he retired in 1656. Harvey was now responsible for the teaching of anatomy at the College, and it is in his early lectures that the idea of the circula-

[1] Read at a meeting arranged by the Victorian Fellows and Members of The Royal Australasian College of Physicians on June 3, 1957, to commemorate the death of William Harvey.

tion of the blood was first formulated. He spent a busy life as a physician with an extensive practice, becoming Physician Extraordinary to James I in 1618, and later, in 1631, Physician in Ordinary to Charles I. Full of years and honour, he died at Roehampton, in Surrey, on June 3, 1657, and was buried at Hempstead, in Essex.

Of his appearance, the best account we have is that of his friend John Aubrey:

> He was not tall; but of the lowest stature, round faced, olivaster complexion; little Eie, round, very black, full of spirit; his haire was black as a Raven, but quite white 20 years before he dyed. . . . He was hott headed, and his thoughts working would many times keepe him from sleepinge; he told me that then his way was to rise out of his Bed and walke about his Chamber in his shirt till he was pretty coole, i.e. till he began to have a horror, and then returne to bed, and sleepe very comfortably.

Harvey's modest, unassuming character is best revealed in the preface to his *De Motu Cordis*, which he addressed to the Fellows of the College of Physicians:

> But my loving Collegs, I had no desire in this Treatise to make a great volume, and to ostentate my memory and labours and my readings in rehearsing, tossing the works, names and opinions of the Authors and writers of Anatomy, both because I do not profess to learn and teach Anatomy from the axioms of Philosophers, but from Dissections and from the fabrick of Nature. As likewise that I do not endeavour, nor think it fit, to defraud any of the antients of the honour due to them, nor provoke any of the moderns; nor do I think it seemly to contest and strive with those that have been excellent in Anatomy, and were my teachers. Moreover I would not willingly lay an aspersion of falsehood upon any that is desirous of the truth, nor blemish any man by accusing him of error; but I follow the truth only, and have bestowed both my pains and charges to that purpose, that I might bring forth something which might be both acceptable to good men, agreeable to learned men, and profitable to literature.

Harvey's Work on the Circulation.

Prior to Harvey the knowledge of the blood, heart and vessels had been very confused, although most authors followed Galen's teaching, maintaining that the liver was the centre of the venous system, that it was the diastole of the heart which attracted the blood, that the blood contained in the veins nourished the limbs and the arterial blood was the source of vitality. The use of the air in respiration was to cool the blood in the arteries of the lung, and the blood passed from right to left ventricles through pores in the interventricular septum. At least this was more satisfactory than the theory of Erasistratus, who stated that the arteries were full of air and conveyed this vital spirit to the brain where, in the ventricles, it was converted into animal spirit, was sent to the periphery of the body by the nerves, which were hollow, and thus activated the body. Galen's teaching was so ingrained into medicine in general and anatomy in particular that little attempt was made either to question his theories or to have them altered. It is true that in 1559 Realdus Colombus (1516-1559) had demonstrated that there were no holes or pores in the interventricular septum, and had described quite clearly a circulation of the blood from the heart to the lungs and back to the heart:

> . . . the blood is carried by the artery-like vein to the lung and being there made thin is brought back thence together with air by the vein-like artery to the left ventricle of the heart. This fact no one has hitherto observed or recorded in writing: yet it may be most readily observed by anyone.

This is the first widely read description of the lesser circulation. However, Colombus had been preceded by Michael Servetus (1511-1553), who had made a similar statement in his *Christianismi Restitutio*; but this had perished at the stake with its author in 1553, although a few copies survived. However, neither Colombus nor Servetus was the first to describe the pulmonary circulation. This honour must go to the anatomist Ibn an-Nafis el Korashi (1210-1288), of Damascus, who described the lesser circulation in a manuscript commentary on the Canon of Avicenna. Indeed, there is evidence that Servetus obtained his description from a manuscript of Ibn an-Nafis.

Therefore, before Harvey started his experiments there was some evidence of a limited circulation of the blood, although its mechanism was not known or at best only partially understood. Moreover, Harvey's teacher at Padua, Hieronymous Fabricius of Aquapendente (1533-1619), had given a very clear picture of the valves of the veins in his *De Venarum Ostiolis* published in 1603 and had shown these to Harvey; but Fabricius had failed to recognize their true function.

When Harvey produced proof of the circulation, it was the result of the correlation of a number of separate discoveries, each important in itself. Most of them had passed unnoticed by his predecessors. Harvey's initial discoveries were as follows:

1. The heart behaves like a muscle when it contracts and in action alternately contracts and relaxes.

2. In systole the apex of the heart strikes the chest wall, and the systole corresponds with and is the cause of the peripheral arterial pulse. This can be shown by the spurting of the blood when an artery is cut.

3. Contraction of the auricles drives blood into the ventricles, and auricular contraction is followed by ventricular contraction.

4. Once blood has entered the aorta or pulmonary artery, it cannot go back, being stopped by the valves.

5. The amount of blood entering the arteries from the heart is, over a given period, very great, even equal to several times the body weight. This was Harvey's most forceful argument.

6. The blood so moved into the arteries comes from the veins. Harvey postulated that there were very small communications at the periphery between the arteries and the veins, but these he did not see. The presence of the capillaries was proved in 1661 by Marcello Malpighi (1628-1694), who observed them in the frog's lung, and later by Antony van Leeuwenhoek (1632-1723), who observed the actual corpuscles circulating in the capillaries of an eel's tail.

7. In the peripheral veins, the valves will allow the blood to travel only in a central direction.

With these basic discoveries, it was a short step to postulating a circulation of the blood.

Harvey's reasoning that a circulation existed was formulated prior to 1616, for his first thoughts are contained in his manuscript note-book now in the British Museum:

> On account of the structure of the heart, William Harvey is of the opinion that the blood is constantly passed through the lungs into the aorta, as by two clacks of a water bellows to raise water. Moreover, on account of a bandage on the vessels of the arm he is of the opinion that there is a transit of blood from the arteries to the veins. It is thus demonstrated that a perpetual motion of the blood in a circle is brought about by the beat of the heart. . . .

He did not rush into print with his discovery; but it is obvious that he taught the facts of the circulation in his Lumleian Lectures, and he spent the next twelve years in perfecting both his experiments and his argument. When finally in 1628 *De Motu Cordis et Sanguinis* was hurriedly printed in Frankfurt by William Fitzer, his thesis and its proof were there for all the scientific world to see. That it was hurriedly printed there seems to be no doubt; the long list of errata added to the later copies of this edition shows that he did not correct the proof-sheets. Possibly the compositor's work was made more difficult by Harvey's abominable writing.

Harvey did not expect, nor did he get, immediate acceptance of his momentous discovery. That he expected the widespread and sometimes vituperative criticism is clearly shown in his *Exercitatio Altera* written to Jean Riolan the younger (1577-1657) in 1649.

> Most learned Riolan, by the help of the Presse, many years ago I published a part of my labour: But since

the birth-day of the circulation of the Blood, almost no day has past, nor the least space of time, in which I have not heard both good and evill of the Circulation of the Blood which I found out: Others rail at it, as a tender babie unworthy to come to light; Others say, that its worthy to be foster'd, and favour my writings, and defend them; Some with great disdain oppose them; Some with mighty applause protect them; Others say, that I have abundantly by many experiments, observations, and ocular testimony, confirm'd the Circulation of the blood against all strength and force of arguments; Others think it not yet sufficiently illustrated, and vindicated from objections. . . . But I think it is a thing unworthy of a Philosopher and a searcher of the truth, to return bad words for bad words; and I think I shall doe better and more advised, if with the light of true and evident observations, I shall wipe away those symptomes of incivility.

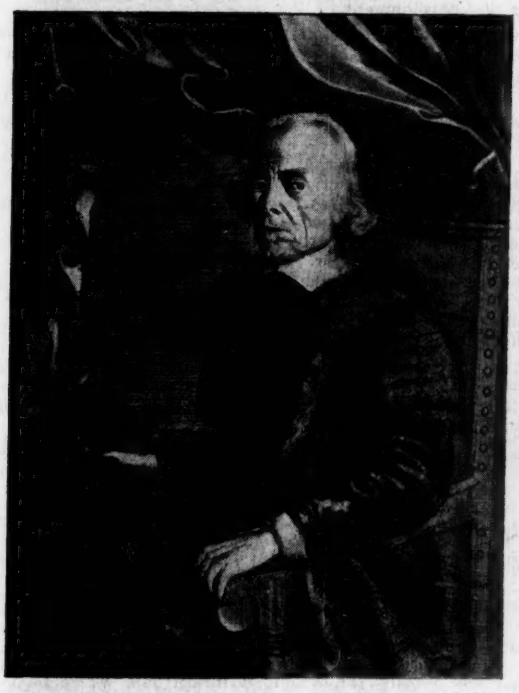


FIGURE I.

An etching of William Harvey in old age. By no means flattering, it is nevertheless a natural portrait. The artist is believed to be Richard Gaywood. (Royal College of Surgeons.)

It cannot be eschewed but doggs will bark and belch up their surfeits; nor can it be help'd but that the Cynicks will be amongst the number of the Philosophers; but we must take a speciall care that they do not bite, nor infect us with their cruel madnesse, or lest they should with their doggs teeth gnaw the very bones or principles of truth. . . .

In my book concerning the motion of the heart and blood in creatures, I only chose out those things out of my many other observations, by which I either thought that errours were confuted, or truth was confirm'd; I left out many things as unnecessary and unprofitable, which notwithstanding are discernable by dissection and sense. . . .

It is interesting to note that this was written to one of his earliest antagonists.

De Motu Cordis was written in Latin, the scientific language of the day, translations into the vernacular being late in appearing. Dutch was the first language into which it was translated in 1650, followed by English in 1653, but it did not appear in other languages until very much later (German, 1878; French, 1879; Russian, 1927; Danish, 1929; Spanish, 1936). Altogether there have been 19 editions in Latin, one in Dutch, 10 in English, three in German, three in French, two in Russian, one in Danish and two in Spanish. This alone is an indication of the importance of his discovery.

Harvey's book provoked a storm of criticism all over Europe; all too suddenly had Galen's sacred writings been proved wrong. Like all controversial books it sold well, 16 editions being printed in the seventeenth century, of which ten appeared in Harvey's lifetime. Many authors produced vehement polemics against Harvey, others with equal enthusiasm praised his theory. Gradually, however, his discovery was accepted by scientists, for his methods of proof were so clearly enunciated in his book that his antagonists had only to repeat his experiments to be convinced of the truth of his arguments. His discovery was accepted in England earlier than on the Continent; but the anticirculationists flourished in London as late as 1701, when Joseph Browne and Oliver Hill railed against the theories of Harvey.

There is, even today, a tendency to deride the thoughts and fumblings of the medical theorists of the past; but it must never be forgotten that it was their work which laid the foundations of modern science. Harvey's work was not a fumbling, but a gathering together of clearly enunciated scientific facts. There is no doubt that when he strayed from his anatomical observations and indulged in theory, Harvey made many mistakes, even showing the

FIGURE II.

The title page of the 1628 edition of *De Motu Cordis et Sanguinis.*

teaching of Galen deeply stamped on his mind. But Harvey's greatness rests on the solid foundation of proven facts as revealed in his *De Motu Cordis et Sanguinis.*

Harvey's Work on Generation.

In 1651, when Harvey was aged seventy-three years, his friend, Sir George Ent, persuaded him to publish his notes on embryology. These were not hastily put together by an old man, they were the fruits of a lifetime of careful observation; but Harvey, for some reason, had

been reluctant to make these public. Although completely overshadowed by his work on the circulation, his *Exercitationes de Generatione Animalium* is a most important work. Ent saw the work through the Press and tells us why in the dedication:

> I made it my Province to over see and correct the Press; and because the Author writes so obscure a Hand (A thing as we say, common to learned men) as that scarce any man, but who hath bin accustomed thereto, can read it without difficulty, I used all diligence to provide against the Errors of the Compositor, that might be occasioned thereby.

The work is quite different from *De Motu Cordis*; the skilled observer is still speaking, but now there is much discussion of and comparison with the work of other authors. As in his earlier book, Harvey is most careful to acknowledge his debt to other authors—a rather unusual thing to do in the seventeenth century.

> Therefore be not offended, Courteous Reader, if in setting out the History of an Egge, and in the description of the Generation of the Chicken, I make use of a new method, and sometimes of unusual terms; nor think me hereby more desirous of vain glory, then of advantaging others by true experiments, and such as are grounded in Natures self. To take off that prejudice, know, I tread but the steps of other men who have lighted me the way, and (so farre as is fit) I make use of their notions. But in chief, of all the Ancients, I follow Aristotle; and of the later Writers, Hieronymus Fabricius ab Aquapendente, Him as my general, and This my guide.

Follow Aristotle and Fabricius he did, but he repeated their work on the development of the chick and corrected many of their mistakes. The greater part of the book (379 pages out of 566) is taken up with the embryology of the chick in all its aspects; then follow observations on the development of the deer, which Harvey had made as early as 1625 in the Royal herd at Hampton Court, and to which he added careful biological experiments. Further chapters of a more general nature follow, and finally there are some observations on human generation. Harvey's powers of description are good, and it is worth quoting his own account of the first appearance of the chick's heart:

> If therefore you observe on the fouth day, you will meet a great Metamorphosis, and wonderfull alteration; which are more evident, for almost every hour all day long: about which time the Egg beginneth to step from the life of a Plant, to the life of an Animal. For now the Limbus or hemme of the Colliquamentum beginneth to blush and purple, being encompassed with a slender bloody line: and in the center almost of it, there leapeth a capering bloody point, which is yet so exceeding small, that in its Diastole, or Dilation, it flasheth onely like the most obscure and almost indiscernable spark of fire; and presently upon its Systole or Contraction, it is too Subtile for the eye, and quite disappeareth. So slender are the first Rudiments of Creatures lives, which the Plastical faculty sets on foot by so undiscoverable beginnings.
>
> If you are desirous to make discovery of this observation towards the declining of the third day, you may if you be extreamly intent, by the assistance of a clear and great light, or by the Sunbeams or a Perspective, make a shift to discerne it. For else, this purple streak is so exceeding nice, and fine, and the motions of the Punctum saliens is so imperceptible, that you will only loose your labour. But at the beginning of the fourth day it is evident, and at the end thereof, most notoriously visible, that the Punctum Sanguineum saliens hath now Animal motion (saith Aristotle) in the candid liquor: And from that Point two hollow threads like veines, full of blood, are carried crooked to the purple Line, and the coat encompassing the coliquamentum: Scattering as they pass along many fibrous branches through the whole space and continent of the colliquamentum all which spring from the same Original (as the boughs of Trees from the same Trunke). In the crooked Angle of this Root, and the Middle of the colliquamentum, the Punctum Rubrum Saliens is enthroned, which keeps time and decorum in its pulsation, compounded of a Systole, and Diastole. In the Diastole, as if it did imbibe a larger proportion of blood, it dilates itself, and leaps; but connives in the Systole, as if it suffered a convulsion by the stroke, and resigned the blood again.

The development of the chick had been very thoroughly worked out by Fabricius, his old teacher, but Harvey did not apparently agree with many of the statements made. He therefore opened developing eggs at daily intervals and recorded his own observations. In this way he corrected some of Fabricius's errors. Rather naturally, he is less exact in his description of the early stages of mammalian embryology, but he was certainly in advance of his time.

Harvey's contribution to embryology can be given quite briefly:

1. He denied the possibility of spontaneous generation.
2. He postulated that all animals came from an ovum, but he did not think the ovary played any part in mammalian development.
3. He was in favour of the theory of epigenesis in contradistinction to that of preformation, and in this was well in advance of contemporary thought.
4. He laid down quite positively that it was from the cicatricula on the yolk membrane that the chick first developed.

Harvey's remark that the ovary played no part in mammalian reproduction appears, at first sight, to be an incredible mistake; but it must be remembered that the ovarian follicle was discovered after his death by Regnier de Graaf in 1672, and the mammalian ovum was described for the first time by Karl Ernst von Baer in 1827. Another remarkable mistake of Harvey's was his statement that the animal fœtus found its own way out of the uterus and he denied the uterus its role in expulsion of the fœtus.

Like many people, Harvey was not infallible in identifying the sex of birds, and the story of his wife's parrot, although it has been told many times, is well worth repeating:

> . . . my wife had an excellent, and a well instructed Parrat, which was long her delight; which was now grown so familiar, that he was permitted to walk at liberty through the whole house; where he missed his Mistresse, he would search her out, and when he had found her, he would court her with a cheerfull congratulation. If she had called him, he would make answer, and flying to her, he would grasp her garments with his claw, and bill, till by degrees he had scaled her shoulder; whence he descending by her arm did constantly seat himself upon her hand. If she bad him talk or sing, were it night and never so darke, he would obey her. Many times when he was sportive and wanton, he would sit in her lap, where he loved to have her scratch his head, and stroke his back; and then testifie his contentment, by kinde mutterings, and shaking of his wings. I still interpreted all this to proceed from his customary familiarity and obsequiousness, for I alwaies thought him to be a Cock-Parrat by his notable excellence in singing and talking. . . . But not long after these kinde dalliances, the Parrat, which had lived many years Sound and healthy, grew sick, and being much oppressed by many convulsive motions, did at length deposite his much lamented spirit in his Mistresses bosom, where he had so often sported. When dissecting his carkase, (to finde out the cause of his death) I found in the womb an egge almost completed, but . . . corrupted.

Unlike his book on the circulation, *De Generatione* was well received, with no opposition, six editions being printed in his lifetime. The book was translated into English in 1653.

Although it tends to be forgotten or overlooked, Harvey's work on embryology was most important, and by itself was sufficient to place its author in a special niche in the history of medicine.

Conclusion.

"Honest little Doctor Harvey", as Lord Arundel called him, amply deserves our homage. He represents the best of the scientific brains of the seventeenth century—that age when the fumblings and gropings of the past were

consolidated and turned into the scientific basis on which our modern knowledge rests.

As Sir George Ent writes in the Epistle Dedicatory of *De Generatione*:

> And thus, most Learned Sirs, have I rendered you the Reason of this my writing to you; which is, to let you know, that our Harvey hath Sacrificed to the Benefit of the Commonwealth of Learning, to the Dignity of our Colledge, and to His own Eternal Honour.
>
> Farewel, and Prosper.

References.

BAYON, H. P. (1938), "William Harvey, Physician and Biologist (Parts I-III)", *Ann. Sc.*, 3: 59, 435.

BAYON, H. P. (1939), "William Harvey, Physician and Biologist (Parts IV, V)", *Ann. Sc.*, 4: 65, 329.

BAYON, H. P. (1947), "William Harvey (1578-1657). His Application of Biological Experiment, Clinical Observation, and Comparative Anatomy to the Problems of Generation", *J. Hist. Med.*, 2: 51.

CHAPMAN, H. C. (1884), "History of the Circulation of the Blood". Philadelphia: Blakiston, Don & Co.

DICK, O. L. (1949) (Editor), "Brief Lives Chiefly of Contemporaries Set Down by John Aubrey between the Years 1669 and 1696". London: Secker and Warburg.

FOSTER, M. (1901), "Lectures on the History of Physiology during the Sixteenth, Seventeeth and Eighteenth Centuries", reprinted 1924, Cambridge University Press.

HARVEY, WILLIAM (1653), "Anatomical Exercitations Concerning the Generation of Living Creatures". London: Octavian Pulleyn.

HARVEY, WILLIAM (1886), *"Prelectiones Anatomiæ Universalis"*. London: Churchill.

HARVEY, WILLIAM (1928), "The Anatomical Exercises of Dr. William Harvey. De Motu Cordis 1628, De Circulatione Sanguinis 1649: The First English Text of 1653 Now Newly Edited by Geoffrey Keynes". London: Nonesuch Press.

KEYNES, G. K. (1949), "The Portraiture of William Harvey". London: Royal College of Surgeons.

KEYNES, G. K. (1953), "A Bibliography of the Writings of Dr. William Harvey", 2nd Edition, revised, Cambridge University Press.

MEYERHOFF, M. (1935), "Ibn-Nafis (XIII Cent.) and His Theory of the Lesser Circulation", *Isis*, 23: 100.

NEEDHAM, J. (1934), "A History of Embryology". Cambridge: University Press.

O'MALLEY, C. D. (1953), "Michael Servetus". Philadelphia: American Philosophical Society.

POWER, D'A. (1897), "William Harvey". London: Fisher Unwin.

POWER, D'A. (1931), "Sir D'Arcy Power, Selected Writings, 1877-1930". Oxford: Clarendon Press.

RUSSELL, K. F. (1953), "The De Re Anatomica of Realdus Colombus", *Australian & New Zealand J. Surg.*, 22: 224.

SINGER, C. (1822), "The Discovery of the Circulation of the Blood". London: Bell.

SINGER, C. (1925), "The Evolution of Anatomy". London: Kegan Paul.

BRONCHITIS, ASTHMA AND EMPHYSEMA IN CHILDHOOD.[1]

By ALAN WILLIAMS,

Department of Pathology, Royal Children's Hospital, Melbourne.

As I am a morbid anatomist my remarks in this symposium on bronchitis, asthma and emphysema in childhood will be limited to a discussion of structural changes occurring in these conditions. The diseases under discussion tonight are rare causes of death in infancy and childhood. Thus the material on which my remarks are based is limited in amount.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on November 14, 1956.

Statistical analysis of any figures I could produce would be worthless, and for the same reason I do not propose to divide the cases of bronchitis into catarrhal, suppurative, fibrinous *et cetera*. I want merely to take the group of bronchial inflammations as a whole, and as these diseases, unless complications occur, are seldom fatal, I want to demonstrate sequelæ of permanent nature and indicate their possible functional significance.

At post-mortem examination inflammatory changes are seldom limited to the bronchi alone. The inflammation commonly involves the trachea or bronchioles or lung tissue—that is, bronchopneumonia. Excluding those in which pneumonia was present, sections from the lungs of approximately fifty infants and children were available for study. In the majority of these children bronchitis was a complicating factor in some other disease processes—for example, congenital heart disease, meningitis, malignant disease *et cetera*. From a study of these sections one could see the varying histology of bronchitis—ranging from a mild inflammation with infiltration of the bronchial wall by leucocytes to the severe destructive suppurative variety.

The histological changes present in acute bronchitis consist of an acute inflammation of the soft tissues of bronchial wall with resultant diminution of the bronchial lumen. The mucosa, which macroscopically has a congested and œdematous appearance, is seen in histological preparations to be increased in thickness owing to increased vascularity, cellular infiltration and dilatation of the mucous glands.

Not infrequently small areas of epithelial destruction are seen, but widespread epithelial destruction was present in only one case in this series. This was the only case in which destruction of other structures of the wall, namely, muscle and elastic tissue, was obvious. The exudate within the lumen will vary in amount and in nature. In any acute inflammation of a mucous surface increased mucus production is a feature. The proportion of mucus to inflammatory exudate or pus varies with the nature of the bronchitis—that is, presumably with the causative agent from the so-called catarrhal variety to the frankly suppurative. In the majority of cases of bronchitis there is an associated bronchiolitis, the features of the inflammatory process being essentially the same.

Now from the histologist's viewpoint asthma is simply a catarrhal bronchitis and bronchiolitis with certain differences:

1. Macroscopically the bronchi are filled with tough, clear, mucinous exudate.

2. The different histological feature is that many of the cells infiltrating the bronchial walls are eosinophile cells. There is nothing to indicate to me that muscle contractions may have played a part in this disease. As a histologist, I see asthma as merely a generalized acute catarrhal bronchitis with swelling of walls, due to increased vascularity and cell infiltration, with an exudate within the lumen and with a bronchiolitis. An increased number of mucus-secreting cells may be present in asthma, but these are seen equally well in the lungs of the patient with recurrent or chronic bronchitis.

With similar structural features in the acute illness—that is, bronchitis and asthma—one would expect that the sequelæ might be similar. What are the possible sequelæ of these changes?

In the acute stage partial or complete obstruction of the lumen is caused by (*a*) an increase in wall thickness, and (*b*) mucus and pus within the bronchi. Normally the cough reflex keeps bronchial secretions moving, but for various reasons, such as loss of ciliated epithelium, there may be a physiological block and obstruction may occur. Obstruction is more common in the smaller tubes—that is, bronchioles—but does occur in bronchi. The sequela is a collapse of a segment of lung—the frequency with which this occurs in bronchitis I do not know. If obstruction persists, "drowning" of collapsed lung by mucus secreted in the bronchial tree distal to the obstruction will occur. In most cases infection probably causes

pneumonia, and I have seen two good examples only of the "drowned" lung (Figure I). That the obstruction may become permanent with obliteration of bronchial or bronchiolar lumen is another possibility. In the lungs of a child with recurrent bronchitis I have found examples of obliterated bronchi (Figure II). The area between the cartilage consists of granulation tissue. Within this tissue small cysts lined by columnar epithelium and containing mucus may be demonstrable. With the aid of serial sections these occluded bronchi may be traced along their length into the lung tissue served by that bronchus. This segment of lung is rarely normal. It may be collapsed, but more frequently it appears to be emphysematous. I think—I am not certain at present—that whether collapse or emphysema occurs depends on the level of bronchial occlusion. When small air passages are occluded the segments of lung tissue which they normally serve may be aerated by the passage of air into them from adjacent lung tissue. This maintenance of aeration in segments whose bronchi were obstructed was demonstrated in experimental animals many years ago.

When the occluded air passage is larger, no such collateral circulation of air may be possible, and collapse and subsequent fibrosis result.

This brings us to bronchiolar obstruction. The temporary obstruction in a child with bronchiolitis, be it infective, asthmatic or of any other nature, may be associated with the radiological appearances of emphysema. Likewise permanent obstruction is associated with emphysema.

For many years it has been recognized that bronchiolar obstruction or destruction is an almost constant finding in emphysematous lungs, or emphysematous portions of lungs. These portions are aerated by means of the collateral air drift which I mentioned previously. Apart from certain special varieties, such as infantile lobar emphysema, emphysematous areas of lungs are seen in children who have pulmonary diseases where bronchiolar obliteration occurs—for example, recurrent bronchitis, asthma, fibrocystic disease of the pancreas. I have said nothing about fibrocystic disease of the pancreas tonight because the lung changes in that disease merit a discussion of their own; but, briefly, infants with that disease suffer from recurrent attacks of bronchitis and bronchiolitis, and at autopsy emphysematous lungs are found.

Bronchiectasis is a condition in which areas of emphysema are often present. Examination of a section of a bronchiectatic lung demonstrates that the intensity of changes is maximal at the periphery. The main bronchi are a little dilated, their distal branches much more so, and the bronchioles are extremely difficult to find. They may be demonstrable in serial sections as scars (Figure III). In other words, obliteration of bronchioles is a prominent feature, in some cases at least, of bronchiectasis. Whether the dilatation of larger bronchi can follow repeated damage due to acute inflammation I do not know, but I do know that an attack of bronchitis may result in bronchiolar destruction.

Thus to me, as a morbid anatomist, the most serious factor in a disease which is regarded as common, and in which death seldom occurs, is that in each attack certain changes of permanent nature may occur. As a result of the bronchial and bronchiolar inflammation in bronchitis (and I include asthma) scarring or obliteration of these structures may occur. That these changes result in the development of emphysema I have little doubt, and the fact that they are so prominent in some examples of bronchiectasis makes me wonder what part they play in the ætiology of that condition.

Legends to Illustrations.

FIGURE I.—Collapsed segment of lung in which many alveoli are distended with mucus. (Hæmatoxylin-PAS.)

FIGURE II.—Bronchial obliteration in recurrent bronchitis. A small bronchial remnant lined by cuboidal epithelium is surrounded by granulation tissue. (Hæmatoxylin-eosin.)

FIGURE III.—Bronchiolar obliteration in emphysematous area of lung with bronchiectasis. Bronchiole replaced by granulation tissue. (Hæmatoxylin-eosin.)

ÆTIOLOGY AND DIAGNOSIS OF BRONCHIAL ASTHMA, BRONCHITIS AND EMPHYSEMA IN CHILDREN.[1]

By STANLEY WILLIAMS,
Melbourne.

IN considering the ætiology and diagnosis of bronchial asthma, bronchitis and emphysema in children, the first thing to emphasize is that there are waves of respiratory infection constantly passing through the community, and the children between three years and five years old are most severely affected. It is possible that this age group circulates most of these respiratory infections, especially in kindergarten and other pre-school gatherings.

Admittedly, infections are passed by droplet infection in any section of the community, whether it be older children at school or adults in offices or hospital.

By whatever means these infections are passed, the children of three years to five years of age develop more definite symptoms of respiratory tract involvement. Presumably, after that age, immunity develops which minimizes the debility from the respiratory infection. However, all age groups suffer anything from two to twenty separate infections per year.

It is likely that many of these infections are of virus origin including the adenovirus, but careful study in various parts of the world, and particularly in Cleveland, has not discovered a causative organism in most respiratory infections.

In London, Cruickshank and his team at Saint Mary's Hospital have found that *Hæmophilus influenzæ* causes respiratory infections in certain groups of children. Of course, the pneumococcus, streptococcus and staphylococcus can produce respiratory disease. Perhaps these pathogens can also act as secondary invaders to the virus infections. In most instances, however, the causative organism defies detection by the most modern means of investigation.

From infection in the bronchi bronchitis ensues, and from that, in conformity with the title of this talk, emphysema can follow. Bronchiolar spasm can be produced by infection or susceptibility when the trigger mechanism is infection or some other cause. Asthmatic children are born with a susceptibility to the production of bronchiolar spasm when they get an infection. This inherited trait to develop asthma is similar to that for eczema, and it is well known that many asthmatics have had, or still get, eczema. There is a family history of dermatitis, hay fever or asthma. It occurs in all suburbs, and no one metropolitan or country area seems to be particularly free. Bronchial asthma is the commonest problem confronting the children's specialist today—how common I have not been able to determine accurately. Amongst chronic complaints in childhood, bronchial asthma forms a large proportion of a practitioner's work.

Diagnosis is usually easy enough in an acute attack of asthma by history and typical signs. However, acute pneumonia, laryngo-tracheo-bronchitis, myocarditis, and an inhaled foreign body need to be considered.

In the more chronic case the patient presents sometimes with merely a complaint of recurring abdominal pain or being "run-down", or both, or mouth breathing through nasal obstruction. A very constant accompaniment of asthma is the swollen nasal mucous membrane. The anorexia and debility of many asthmatics are associated with an inability to digest adequately, and the exact mechanism of this effect on the stomach is not clear to me. In fact, there are many unknowns, but that should not prevent us from having a practical routine line of investigation and treatment.

Each child needs the usual good history, with reference to susceptibility to infections, emotional stress, susceptibility to food, dust, type of pillow and mattress.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on November 14, 1956.

A Mantoux test and chest X-ray examination are required. The place of skin tests is controversial, and in my experience skin tests seldom help in the management of an individual child.

In many apparently chronic persistent cases the patients on closer inquiry are shown to be suffering from recurrent respiratory infections which precipitate asthma so frequently that the parents have the impression it is constant. It is often reassuring to the parents to know that fresh respiratory infections are contributing to the debility and that the child is not a chronic invalid. Unfortunately, there are children with persistent asthma in whom the precipitating cause is not known. The average child develops a resistance to these infections and, whatever the true mechanism of asthma, tends to desensitize himself and lose the attacks from the golden age of seven years.

It is generally conceded that emotional factors play a considerable part in the production of asthma, and asthmatic children have a sensitive temperament.

Emotional stress produces an attack most readily when the susceptible child has a mild infection, and then overexertion or excitement leads to the attack. The asthmatic child, when feeling well and free from respiratory infection or asthma, can tolerate the common excitements of childhood, such as a birthday or a trip to the circus, quite as well as other children.

In a minority of cases, however, emotional stress, often associated with particularly anxious parents, is the outstanding feature. It is understandable that as asthma is an inherited trait, we have to deal with parents, one or other of whom has the same sensitive make-up as the child.

As with many other diseases, reassurance and guidance to parents and the child, following an assessment of the factors involved, play an important part in management.

Whoever looks after an asthmatic needs to have a sympathetic bond with the patient and parent, and the doctor needs to be prepared to help at all times. Such help is preferably by anticipating trouble, not only in the treatment of the acute episode, but in the reassurance needed to cover the frequent debility throughout the susceptible period.

TREATMENT OF THE ASTHMATIC CHILD.[1]

By IVAN MAXWELL,
Melbourne.

IN discussing the medical treatment of the asthmatic child it will be assumed that he or she is ten years of age. For other ages the appropriate modification of dosage should be made.

It is of the greatest importance that an asthmatic should have his symptoms reduced to a minimum, and possibly entirely controlled by the daily administration of a suitable medicine. A mixture containing potassium iodide five grains, theophylline one and a half grains or aminophylline one and a half grains, ephedrine one-quarter of a grain and phenobarbitone one-quarter of a grain, given night and morning, usually proves very helpful. Phenobarbitone is included to offset the action of ephedrine, which may cause wakefulness in some patients. For those who are not aspirin sensitive, aspirin (acid acetyl salicylic) five grains may replace the iodide with great benefit to the child in a high percentage of cases. There is far too much apprehension concerning the prescribing of aspirin for asthmatics. A careful inquiry will frequently elicit the information that aspirin or aspirin-containing tablets or mixtures have been given to the patient for various reasons without aggravation and indeed in many instances with much relief of his asthma. Before prescribing aspirin in a mixture it should be the invariable rule to inquire from the parents whether the child has ever had aspirin and if it agrees with him. If they state that it does, then it should be included in the medicine. It has been shown recently by Trethewie, of the Physiology Department of the University of Melbourne, that contraction of sensitized bronchiolar muscle in the presence of the sensitizing antigen is much diminished by aspirin, and therefore there is now definite pharmacological support for its inclusion in the therapy of asthma.

Aspirin, ephedrine and theophylline or aminophylline may be regarded as synergic in their action in most asthmatics. Such a mixture has been used for many years at the Royal Melbourne Hospital, with much relief to those suffering from bronchial asthma. It is usually desirable for the child to take this mixture or the iodide mixture for many months so as to keep his asthma continuously under control. If at any time the symptoms become more acute, then either of the mixtures may be taken four times a day, preferably before meals and at bed time.

Ephedrine hydrochloride one-quarter of a grain is a sympathomimetic drug which acts in a manner similar to adrenaline, but not so powerfully. It is usually given as tablets by mouth, but can also be administered hypodermically. One-quarter or one-half of a tablet of isoprenaline ("Neo-Epinine", "Isuprel"), when placed under the tongue, may be very useful in allaying mild asthma or, when taken after the main mixture, tends to reinforce its action. Its general pharmacological action is similar to that of adrenaline, but is not so powerful. It has the advantage that it does not have to be given hypodermically. An adrenaline solution (1% to 10%) used as a very fine spray and inhaled may stop mild attacks.

Anti-histamines are disappointing therapeutically. Whilst they are of undoubted value in the treatment of hay fever, they seldom are of much help in the therapy of asthma, though "Phenergan" (10 to 25 milligrammes) given at bed time may be of some value as a supplement to other medicines.

It is essential that the patient should have reasonably good sleep at night. Phenobarbitone half a grain or "Seconal" one grain may be effective hypnotics. On no account should morphine be given.

If an infection in the respiratory tract is present, an effort should be made to eradicate it by the use of sulphonamides; if these fail, then an antibiotic should be tried.

The antibiotic most frequently used is penicillin. Whilst this is remarkable in its action on penicillin-sensitive organisms, it has two disadvantages: first, to be effective it usually has to be given by injection, though recently a fairly satisfactory form for oral administration has become available; second, patients, and particularly asthmatic patients, may become allergic to it, and an injection may be followed by a severe and sometimes fatal reaction.

Adrenaline hydrochloride (1:1000) should always be at hand to treat any severe reaction if one should occur. Large doses of adrenaline may be life-saving if there is acute collapse of the patient.

In a chronic asthmatic patient with evidence of bronchial infection it is desirable before commencing treatment with an antibiotic to test the sensitivity of the microorganisms present in the upper and lower respiratory tract. In many instances it may be thought desirable to commence treatment whilst one is awaiting the results of the sensitivity tests and then change the antibiotic if necessary according to the laboratory report.

The chief antibiotics available for oral administration are tetracycline ("Achromycin", "Tetracyn"), which has a fundamental structure common to chlortetracycline ("Aureomycin") and oxytetracycline ("Terramycin"). The actions of these three are very similar. Chloramphenicol may in some instances prove more effective than those mentioned.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on November 14, 1956.

Despite the use of the various medicinal measures discussed, the patient may still exhibit intractable perennial asthma. In such circumstances treatment should be initiated with adrenal corticosteroids. In the writer's experience (and the work of others supports this finding) hydrocortisone is preferable to cortisone, but the newer preparations prednisone and prednisolone are the most satisfactory of all as they have fewer undesirable side effects. The dosage of prednisolone ("Meticortelone", "Deltacortef", and "Deltacortril" are some of the many trade names for this steroid) has varied from patient to patient. For most children of ten years the initial dose is 7·5 milligrammes three times per day after meals. This suppressive dosage should be continued until a response is obtained, which usually occurs in three to six days; then the dosage is reduced by 2·5 milligrammes per day until the minimum daily maintenance dose is determined. This may vary from 2·5 to 7·5 milligrammes per day or even more. The maintenance dose may be continued for months or years if necessary. A careful watch should be kept for any side actions of this drug, such as retention of fluid with œdema and moon face, but with this steroid these seldom occur. Throughout the treatment, sodium chloride may be allowed in sufficient amount to render food palatable.

The adrenal cortex produces various corticosteroids including hydrocortisone and aldosterone, but this production is suppressed by prolonged oral administration of corticosteroids and the cortex tends to atrophy. It is desirable therefore after one or two months to reduce gradually and finally to stop the corticosteroid therapy and replace it by the daily injection of 10 to 20 international units of corticotrophin (adrenocorticotrophic hormone—ACTH), preferably as a long-acting corticotrophin. This stimulates the cortex to greater production of corticosteroids, and at the same time may restore the cortex to its normal size. Such injections may be given for a week, and then administration of prednisolone in appropriate quantity is once more commenced. It must be emphasized that continual watch for abnormal symptoms must be kept on all patients having prolonged treatment and the dosage of the steroid adjusted to the patient's needs, which may at any time be considerably increased by an acute respiratory infection. The infection should be treated with an appropriate antibiotic. If, as occasionally happens, there is no improvement after treatment with full doses of prednisolone for six days, then its use should be discontinued and corticotrophin injections given as described in the section on *status asthmaticus*.

Status Asthmaticus.

During the course of chronic asthma the patient may at any time have an acute exacerbation of his symptoms which, if it is continuous and acute, is referred to as *status asthmaticus*. It is usually precipitated by an infection of the respiratory tract, and this should be treated with a suitable antibiotic as previously mentioned. The immediate treatment of the bronchiolar spasm and associated œdema which are causing the acute dyspnœa is the hypodermic injection of adrenaline hydrochloride (1:1000); 0·5 millilitre is slowly administered (0·1 millilitre every minute), and this usually gives temporary relief, but may have to be repeated every hour for several hours. Some patients in *status asthmaticus* are insensitive to adrenaline and fail to improve with such therapy. In such circumstances resource may be had to aminophylline 0·12 to 0·24 gramme given very slowly intravenously, or alternatively intramuscularly every six hours. To induce sleep "Seconal" one and a half grains or "Tuinal" one and a half grains, given orally, and repeated if necessary, is usually effective, but sodium phenobarbitone one grain given intramuscularly is a good alternative. As previously stated, on no account should morphine be given, as it greatly increases the possibility of a fatal issue.

If the foregoing measures do not cause a marked improvement in the patient's condition within twenty-four or thirty-six hours, then either corticotrophin should be given intravenously or prednisolone by mouth (provided the patient is not vomiting). The use of corticotrophin assumes that the patient's adrenal cortex is responsive to stimulation and will produce the steroids (chiefly hydrocortisone) which will alleviate the asthmatic condition. Corticotrophin itself has no direct action on the bronchial tubes. It is possible that in some cases of *status asthmaticus* the adrenal cortex is completely exhausted, and this may account for the failure of some patients to respond to corticotrophin. It is best given as an intravenous infusion with 5% glucose solution. The usual amount given in twenty-four hours is 20 to 24 international units. If for any reason it is not possible to give an intravenous infusion, then the corticotrophin may be injected intramuscularly five to ten units every four hours, but this is usually not as effective as the intravenous infusion.

As an alternative to giving corticotrophin, prednisolone may be administered orally, 10·0 to 15·0 milligrammes every six hours until the attack is abating; the amount may then be reduced to 5·0 milligrammes and then 2·5 milligrammes every six hours; and finally to the requisite maintenance dosage. It is impossible to predict whether intravenous infusion of corticotrophin or the administration of large doses of predisolone will be the more effective. If hospital facilities are not available, it is better to use prednisolone as described, and only if this fails resort to corticotrophin.

This then is a brief summary of the medical treatment of the asthmatic child. Were time not so limited, I would have discussed the avoidance of specific causative factors, psychological treatment, breathing exercises and hyposensitization in so far as these measures are indicated in any individual patient. They may play a very important part in the control of the patient's asthma, and I hope they will be commented on during the general discussion later in the evening. The consideration of nasal infection I have left to the nose specialists.

In conclusion, it may be said that the outlook for the asthmatic child has greatly improved since the introduction of modern therapy.

SPONTANEOUS RUPTURE OF THE ŒSOPHAGUS.

By HARRY M. WINDSOR AND ROSS M. DUNN,

From the Thoracic Surgical Department, Saint Vincent's Hospital, Sydney, and the Thoracic Surgical Department, Repatriation General Hospital, Concord, Sydney.

Ætiology.

SPONTANEOUS rupture of the œsophagus, with few exceptions, is due to sudden increase in intraœsophageal pressure. This pressure can rise suddenly in the following two ways: (i) from sudden increase in intraabdominal pressure, (ii) from sudden increase in intracervical pressure.

Sudden Increase in Intraabdominal Pressure.

A sudden increase in intraabdominal pressure may be produced by any of the following: (*a*) vomiting with a full stomach, (*b*) vomiting with an empty stomach, (*c*) external violence, (*d*) muscular violence.

Vomiting with a Full Stomach.

The typical cases occur in the group in which the rupture is due to vomiting with a full stomach. Barrett's papers (1946, 1947) focused the attention of the surgical world upon this strange condition. Our first case is an example.

CASE I.—A., a man, aged fifty-four years, was admitted to the Repatriation General Hospital, Concord, Sydney, at 1 a.m. on September 16, 1955. At that time he was non-cooperative, and no history could be obtained. He was in agonizing epigastric pain. His abdomen was board-like. A diagnosis

of ruptured peptic ulcer was made, and at 4 a.m. a laparotomy was performed. No abnormality was found. Upon awakening he continued in intense pain. The abdomen remained board-like. Soon after this it was noticed that his face was puffy. At 9 a.m. it was still impossible to obtain a history. His pulse rate was 108 per minute, his temperature was 98° F., his respirations numbered 30 per minute, and his blood pressure was 90 millimetres of mercury, systolic, and 60 millimetres, diastolic. He had gross surgical emphysema (Figure I) of the face and neck. He had a left hydropneumothorax, which was confirmed by a chest X-ray examination made with a portable machine (Figure II). A diagnosis of spontaneous rupture of the œsophagus was made.

FIGURE I.

Case I: Showing gross surgical emphysema of face and neck.

Left thoracotomy (H.W.) was carried out at 10 a.m. When the chest was opened, one pint of thin, infected fluid was removed. The mediastinum from the diaphragm to the neck was white and bulging with air bubbles. The mediastinal pleura over the lower part of the œsophagus was incised, after which an abscess cavity containing thin grey pus and a quantity of chopped cabbage, cheese and meat (Figure III) was entered. This was emptied. A rent one inch long was then seen in the œsophagus just above the cardia. This was closed in two layers. The pleural cavity was washed out with saline and tube drainage was instituted.

It was in the immediate post-operative period that the history was obtained. At 5 p.m. on September 15, eight hours before his admission to hospital, he had eaten a spring roll. He drank four glasses of beer between 7.30 p.m. and 9.45 p.m. He walked home, a distance of a quarter of a mile, felt nauseated, went to the toilet, and vomited. From that moment his agony began. He variously described his experience as "like something tearing", "something went bang", "something opened up", and "everything rolled up in one".

After thoracotomy all was well until feeding via the intragastric tube was begun on September 22. On the next day he had a temperature of 102° F., a pulse rate of 130 per minute, a fluid level in his chest X-ray film and, most humiliating, milk in the thoracotomy tube.

A further thoracotomy was performed at once and all debris was removed from the chest. A coincident jejunostomy was established (R.D.). After this there was slow, gradual improvement. The œsophago-cutaneous fistula closed in three weeks. The patient was discharged from hospital with the jejunostomy closed on November 2, 1955.

The history and findings mirror those in many cases already published. The sequence of food and alcohol intake, vomiting and pain, followed by Barrett's triad of dyspnœa, abdominal rigidity and surgical emphysema, is now a commonplace in the literature.

Vomiting is a series of coordinated movements wherein a stomach, with body and cardia relaxed and pylorus contracted, is compressed by convulsive abdominal movement, the result being ejection of gastric contents into the œsophagus. The larynx is drawn upwards and forwards by the protruded tongue, the size of the œsophageal outlet

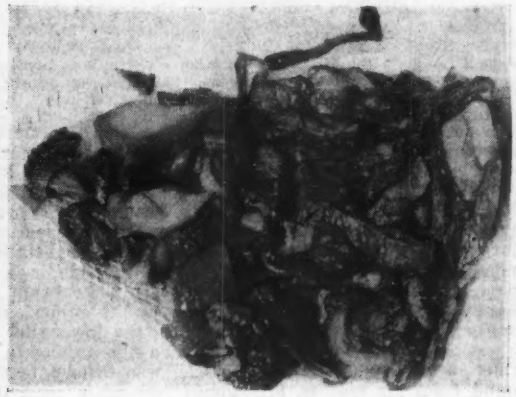


FIGURE III.

Case I: Showing the collection of cabbage, cheese and meat found in the mediastinum.

being thereby increased and the ejection of the vomitus facilitated. Towards the end of the act, closure of the glottis and ascent of the diaphragm result in a positive intrapleural pressure and further œsophageal compression.

During retching, incoordinate movements occur, the diaphragm often descending during contraction of the muscles of expiration. Mackenzie (1880) and Mackler (1952, quoting Meyer, 1858) have shown that a pressure of seven pounds of water is sufficient to rupture the œsophagus. Such pressures are easily exceeded during violent abdominal and diaphragmatic compression of the stomach, if the glottic and pharyngeal apertures are closed. The rupture very probably occurs during one such movement of incoordination.

That this obstructive element is of significance is supported by a number of reports in which rupture took place in a healthy œsophagus below a site of obstruction. Meyer (1858) and Fitz (1877) reported ruptures following vomiting in attempts to dislodge impacted fragments of meat. Menne and More (1921) reported a similar episode in a baby, aged five months. In this instance the obstructing element was a curd of milk.

Kernan (1950), Boyd and Eytinge (1951) have described ruptures occurring during the vomiting of duodenal obstruction.

Vomiting with an Empty Stomach.

CASE II.—B., a woman, aged fifty-three years, was admitted to Saint Vincent's Hospital, Sydney, in September, 1952. She was in considerable pain from a grade IV carcinoma of the cervix. She died on October 20. In the week preceding her death she had had a great deal of retching and abdominal discomfort. At autopsy a one-inch tear was found in the œsophagus just above the diaphragm. Gastric contents were found in the left pleural cavity.

Mackler (1952) reports similar examples, the causes of the vomiting being as varied as seasickness, anæsthesia, lesions of the central nervous system, self-induction and secondary deposits in the peritoneum. The following case is in this category:

CASE III.—C., a man, aged fifty-four years, was admitted to Saint Vincent's Hospital, Sydney on July 14, 1955. Two hours before his admission he had had a cerebral hæmorrhage. He died four hours after his admission without regaining consciousness. At autopsy, performed on July 15, a longitudinal rent was found in the left lower part of the œsophagus. Gastric contents were present in the mediastinum.

MacIver *et alii* (1956) reported 17 cases of rupture of the œsophagus associated with lesions (mainly head injuries) of the central nervous system. It is their contention that the tears are mechanical and occur during the incoordinated vomiting or retching associated with injury to the hypothalamus or pathways leading thereto.

External Violence.

CASE IV.—D., a man, aged twenty-four years, was involved in a motor-cycle accident on July 29, 1951. He was admitted to Saint Vincent's Hospital, Sydney, on that day, in a comatose state. On July 30 a craniotomy was carried out and a subdural hæmatoma evacuated. He died on July 31. At autopsy a hæmatoma was found in the left lobe of the liver. There was a one-inch tear in the œsophagus just above the diaphragm.

Reports of similar injuries have been published by Mackler, Cram and Gardner. Mackler (1952) reported the injury occurring in a British soldier during the Italian campaign. The man was thrown from his motor-cycle across a milestone, his epigastrium bearing the brunt of the force. He died fourteen hours after the injury, and autopsy revealed a longitudinal rent in the lower end of the œsophagus. Cram (1954) reported the injury in a farmer, aged twenty-eight years, who was thrown to the ground from his tractor, his epigastrium again receiving the impact. A diagnosis of ruptured spleen was made and a laparotomy performed. No lesion was found. He died twenty-four hours after the injury, and autopsy revealed a rent in the lower end of the œsophagus. Gardner *et alii* (1949) reported the injury in a man, aged thirty years, who was winded at hockey. A mediastinotomy was carried out eighteen hours after the injury. This was followed by an œsophageal fistula, but the patient ultimately recovered. This is the only report of a patient's surviving this injury.

Muscular Violence.

The occurrence of rupture of the œsophagus has been reported to follow weight-lifting, childbirth, defæcation and epileptic fits (Anderson, 1952).

Sudden Increase in Intracervical Pressure.

Dr. M. Windsor, of Brisbane, has permitted us to report the following instructive case, which was managed by him at the Brisbane General Hospital.

CASE V.—At 4 p.m. on December 28, 1955, E., a man, aged thirty years, was struck on the thyroid cartilage by a fragment from a broken electric drill. He was admitted at once to the Ipswich Hospital with severe dyspnœa and stridor. He remained in this condition for twenty-four hours, and was then transferred a distance of 24 miles to the Brisbane General Hospital. At 4 p.m. on December 29 an emergency tracheotomy was performed and a considerable quantity of blood removed from within the bronchial tree.

The patient now had complete œsophageal and laryngeal obstruction. He had pronounced surgical emphysema in the neck. His pulse rate was 140 per minute, his temperature was 102° F., and his respirations numbered 32 per minute. X-ray examination of his chest revealed a left pneumothorax. A small intercostal catheter was inserted. This gave considerable relief. At once the suspicion of œsophageal injury was aroused, and throughout the succeeding day an endeavour was made to demonstrate the presence of an intrathoracic rupture of the œsophagus. The patient was unable to swallow even the smallest amount of "Lipiodol" or methylene blue. The little that did pass the bruised laryngopharynx trickled through the cords and was sucked out through the tracheotomy tube.

By 5 p.m. on December 30 his condition had deteriorated. His temperature was 103° F., and his pulse rate 145 per minute, and his respirations numbered 34 per minute. An X-ray film of his chest taken at this time is shown in Figure IV. A little fluid had trickled through the intercostal catheter. This was neutral to litmus, but it was faintly opalescent and contained a few fibrin shreds. This finding, together with the increasing toxæmia, made an œsophageal rupture almost certain; but certainty had to be established, for with total laryngeal and pharyngeal obstruction, wet lungs and severe toxæmia he was in no condition for thoracotomy. For this reason thoracoscopy was carried out at 7 p.m. on December 30. It was at once diagnostic. The pleura over the œsophagus in the left superior mediastinum was œdematous and bubble-studded. An immediate thoracotomy was performed. Thin, infected fluid was removed from the pleural cavity. The superior mediastinum was opened. The tissues were œdematous and orientation was difficult; however, a small perioesophageal abscess was found and drained. The chest was closed with underwater drainage. The anæsthetic was most carefully administered by Dr. Ruth Molphy.

On January 2, 1956, a feeding gastrostomy was established. A large empyema developed; this was drained on January 12. After this, improvement began. The tracheotomy tube was removed on January 24, the stoma closing spontaneously a few days later. By February 12 he was able to swallow, and X-ray examination with "Lipiodol" demonstrated for the first time the presence of an œsophago-pleural fistula in the left superior mediastinum. His left recurrent nerve was found to be paralysed. Despite continued and adequate drainage, the empyema space with the œsophageal fistula persisted. It was necessary to carry out a left upper thoracoplasty before closure was obtained. He was ultimately discharged from hospital, swallowing normally, with the gastrostomy closed, on July 1. His recurrent nerve did not recover.

If we take a gaseous drink such as ginger-ale and hurriedly swallow a mouthful, we often swallow a small amount of fluid but a considerable amount of air. We have all experienced the discomfort, and in some cases actual pain, which accompanies the œsophageal distension so produced. There is no reason why such a bolus under pressure should not rupture the œsophagus. In Case V we feel certain that the impact on the thyroid cartilage was responsible for the forcible passage of air down the œsophagus, with superior mediastinal rupture.

Pathology.

The rupture most frequently occurs on the left side just above the diaphragm. This is the one completely unprotected segment of the viscus. Above this, trachea, aortic arch, descending aorta and vertebral column are intimate relations, and undoubtedly buttress the viscus against sudden increases in intraœsophageal pressure. Here there is no lateral protection, and in addition to receiving the full force of any sudden increase in intragastric pressure, the segment will be subjected to positive pressures from both pleural cavities.

Rupture rarely takes place at higher levels. Nanson and Walker (1953) have described an instructive case in which partial rupture took place in the mid-œsophagus. The patient, a woman, aged sixty-seven years, whilst eating a piece of Swiss roll, developed epigastric pain, radiating through the chest and into the neck. Her condition allowed of full investigation. X-ray examination with a barium bolus demonstrated a small protrusion on the left side just below the left bronchus. Four days later this examination was repeated. The protrusion had cascaded and was now of considerable length. At œsophagoscopy, performed twenty-four hours after the second X-ray examination, barium was squeezed out of the mouth of the diverticulum. The patient was treated by thoracotomy, drainage of the mediastinum, and gastrostomy. X-ray examination with a barium bolus prior to her discharge from hospital showed that the protrusion had disappeared, whilst œsophagoscopic examination revealed a small area of granulation tissue where the mouth of the diverticulum had been. This would appear to have been a partial or intraluminal rupture of the œsophagus.

Russell (1953) described a case of rupture occurring in the neck. The patient, a woman, aged thirty-five years, developed surgical emphysema in the neck five hours after vomiting. A lateral X-ray film of the neck demonstrated a large retropharyngeal collection of air. There was no pneumothorax. Exploration through a collar incision confirmed the presence of a tear just below the commencement of the œsophagus in its left antero-lateral wall. This was sutured, after which procedure the patient made a good recovery.

In Case V rupture occurred in the superior mediastinum.

A longitudinal one-inch tear is the lesion usually encountered. At one extreme lies the complete transverse tear (Higginson and Clagett, 1948); at the other, the unidentifiable opening. In this latter a small sealed hole is surrounded by a variable quantity of pus and air. Between these two extremes is the partial rupture (Nanson and Walker, 1955).

In most cases there is no opening in the mediastinal pleura. It is raised into a foam by myriads of air bubbles, the process stretching into the fissures of the lung. The pleura is permeable to the respiratory gases, and these gases leak through to a greater or lesser extent. The presence and extent of pneumothorax will be related to the size of the œsophageal opening, to the size of the pleural opening (if any) and to the amount of air in contact with the visceral pleura. In 90% of reported cases a pneumothorax was present. An adherent lung can easily prevent pneumothorax formation. This has been responsible for failure of diagnosis on a number of occasions.

We are not concerned in this paper with the end results of suppurative mediastinitis, pericarditis and empyema. However, we should like to stress that the œsophageal opening may be small, the pleural opening absent and the outcome of the incident a localized mediastinal abscess. This fact must be fully appreciated if late cases are to be managed correctly.

Clinical Aspects.

It is not intended to dilate upon the now firmly established clinical syndrome of spontaneous rupture of the œsophagus. Case I in this paper is typical of the condition. Barrett reduced the significant findings to the triad of dyspnœa, abdominal rigidity and subcutaneous emphysema. Mackler made a further simplification. He stated that "sudden chest pain during or shortly after vomiting followed by interstitial emphysema at the base of the neck constitutes sufficient evidence to warrant a left thoracotomy".

The clue to correct diagnosis lies in the suprasternal notch. It is there that the rewarding crepitations will be felt. It ought to be palpated as routine procedure in suspected acute conditions of the upper part of the abdomen.

Kinsella (United States of America, 1948, 1951) has stated that the condition can be diagnosed over the telephone. With manifest pneumothorax and surgical emphysema this is so. In over 90% of reported cases a pneumothorax has been present (left 60%, right 26%, bilateral 18%). In nearly 70% surgical emphysema has been present. It is the absence of one or both of these signs which obscures the diagnosis.

Air will always escape when rupture takes place; but that does not necessarily mean that it will reach the pleural cavity or neck. If the lung is adherent—and those who open the chest know that this is not a common finding—then pneumothorax cannot occur.

Likewise air may not reach the neck. We have seen traumatic œsophageal ruptures in which the mediastinum and interlobes were full of air, but the neck was free. Flipse (1951) has described a case in which pneumothorax and surgical emphysema were absent, and in which the diagnosis was made at autopsy, when gangrenous mediastinitis and a large irregular perforation of the œsophagus were found.

It is in cases such as this that careful radiological examination clinches the diagnosis. A widened mediastinum, tell-tale mediastinal air bubbles and a suspicious hold-up or even tiny leak of swallowed oil ought to be objects for search by the wary clinician.

The picture then is modified by the presence of these two features. Apart from this, however, unusual cases occur. We refer to partial rupture (Nanson), cervical rupture (Russell), and superior mediastinal rupture (Case V of this report).

Evidence of leak following the ingestion of oil or methylene blue and the needling of œsophago-gastric contents from the pleural cavities are diagnostic. Even these have their limitations. In Case V the patient had complete œsophageal obstruction and could not swallow. The pleural fluid was neutral in reaction, and contained a few fibrin clots. However, the pneumothorax, the surgical emphysema and the severe toxæmia could hardly be accounted for by anything other than an œsophageal rupture.

In differential diagnosis we have found the thoracoscope of great value. In Case V, in which an ill-advised thoracotomy could have been fatal, thoracoscopic examination dictated the course to be taken. The dramatic sight of the reddened, œdematous, bubble-studded pleura of the superior mediastinum was diagnostic.

In the presence of surgical emphysema and pneumothorax, œsophageal rupture ought never be mistaken for an acute condition of the upper part of the abdomen or coronary occlusion. In my experience the only condition to simulate spontaneous rupture of the œsophagus has been left spontaneous pneumothorax.

Two patients have been referred with a diagnosis of spontaneous rupture of the œsophagus, because of the presence of a left pneumothorax and cervical emphysema. In both instances the correct diagnosis of ruptured tension cyst of the lung was quickly established by means of thoracoscopy.

Prognosis.

In 141 reported cases there were 93 deaths, a mortality rate of 65%. No patient survived without surgical interference.

At one end of the scale is the rapidly fatal case. Kinsella analysed 53 cases, of which 45 terminated fatally within forty-eight hours. The prostration and early death of these people are due, as was pointed out by Gott (1933), not to bacterial invasion, but rather to the irritant and digestive action of gastric contents on the mediastinum. Case I was in this category. Nothing but immediate operation can save these patients.

At the other end of the scale is an extrardinary case reported by Overholt (1952), as follows:

> I would like to report a rather unusual case in which the etiology was related to acute alcoholism. There was a long interval between œsophageal rupture and mediastinal drainage. During this interval, the same liquid that precipitated the rupture was the only nourishment taken and probably favorably influenced the outcome. This patient was on a hunting trip and, because there were no deer the first day, he began drinking. Late in the evening there was some scuffling and wrestling and finally he ended up at the bottom of a pile of hunters. Soon his friends noted marked swelling of his neck and face. Swallowing was painful. On the following day, while the rest of the men went out hunting, he stayed in bed, sipping Scotch whisky. He was there eight days and on the return trip the patient was so critically ill that his friends took him to a hospital, where he remained for four days.
>
> A barium swallow was given which revealed an œsophageal communication with both pleural cavities and a massive bilateral empyema. Closed drainage was provided after bilateral rib resection and aspiration of purulent material and food contents. Due to marked inflammatory reaction everywhere, no attempt was made to repair the œsophageal defect. There was a rent about 7 centimetres in length. The patient carried and was fed through a Levine tube for 67 days.

This patient was alive and well five years later.

If the proper surgical principles governing the management of infection in the chest are observed, more of these late cases will end in survival.

The association between head injuries and spontaneous rupture must be remembered. MacIver *et alii* (1956) pointed out that three of their 17 patients might have been saved had chest operation been undertaken. Awareness in the neurosurgical departments might well lead to a series of successful interventions.

Treatment.

It is hardly necessary to stress the importance of intravenous and antibiotic therapy.

In an endeavour to discover the correct principles governing treatment, we have analysed all the recorded recoveries to be found in the literature. There have been 48 survivors (34%), whom we have divided into the following two categories: (*a*) those whose post-operative convalescence was uneventful (13); (*b*) those who recovered after sustaining post-operative complications (35). Of the 35 patients in the second category, 17 had an œsophageal fistula with or without empyema, and 18 had empyema.

First Category.

There were 13 patients in the first group. With two exceptions they were all operated upon within twenty-four hours. The remaining two were subjected to operation on the fifth and the eighteenth day respectively. Eleven were treated by thoracotomy and closure of the rent. Of the two remaining patients, one had an incomplete rupture (Nanson), and one rapidly recovered after open drainage of the pleural space.

We believe that there can be little doubt that the correct treatment for a patient examined within twenty-our hours of onset is thoracotomy and closure of the rent.

Second Category.

In many of the fatal cases the patients lost their lives after the onset of a post-operative œsophageal fistula. An analysis of those 35 cases in which the patients survived after the development of an œsophageal fistula or empyema gives the following information.

Delay in Operation.—In sharp distinction to the time lag in the uncomplicated cases was the inordinate delay prior to operation in this group. The average was six and two-third days. In most cases the œsophagus was then approached through established intrapleural and mediastinal areas of infection, closure of the œsophageal rent being undertaken after drainage of an empyema and in some cases decortication of the lung.

Appearance of the Fistula.—On an average the fistula appeared on the seventh post-operative day and lasted for a period varying from days to months. In 16 cases spontaneous closure occurred, and in only one was definitive closure successful. Attempts at definitive closure played a prominent part in cases with a fatal termination. We believe, despite isolated brilliant successes (Shaw, 1952), that an œsophageal fistula ought not be interfered with. Most fistulæ will close. Definitive operations usually fail, and merely open up further tissue planes to what is at the best of times a virulent process.

Tube Feeding.—Prominent in the case histories is the statement: "Following thoracotomy gastric tube feeding was instituted; on the fifth day milk appeared in the thoracotomy tube." Exactly that happened to us in Case I. The only safe place for nutriment in these cases is well down in the jejunum, and if a tube cannot be passed well down—and sometimes it cannot—a jejunostomy is indicated. It is simple and safe and satisfactorily conquers the feeding problem. Gastrostomy is likewise contra-indicated in ruptures immediately above the diaphragm. The literature abounds with reports of feedings given by a gastrostomy running out the thoracotomy tube.

Drainage of the Pleural Cavity.—In many cases inadequate drainage of the pleural cavity was carried out. The pleural cavity must be completely emptied of air and fluid and maintained that way by correct use of tubes and suction. If not, at the very least an empyema will result. We believe that failure to observe the fundamental principles of drainage was responsible for most of the eighteen empyemata.

Comment.—No dogmatic statement can be made about the correct management in these late cases. However, the pathology of the condition is such that there is often no opening in the mediastinal pleura, and the area around the rupture is the site of a putrescent food-containing abscess. This must be drained. Likewise must the pleural cavity be drained. The rent is best left alone. The literature of the attempts at closure is strewn with fatalities. To sum up, we believe that operative drainage of mediastinum and pleura, careful continued post-operative drainage of the pleura, and jejunal feeding for at least two weeks are the fundamentals to be attained.

Summary.

Five further cases of spontaneous rupture of the œsophagus, in two of which the patients survived after operation, have been presented. Attention is drawn to (i) cases in which intrathoracic rupture followed abdominal and cervical trauma, (ii) the significance of an absent pneumothorax, (iii) the use of the thoracoscope, and (iv) certain features in the management of late cases.

References.

ANDERSON, R. L. (1952), "Rupture of the Esophagus", *J. Thoracic Surg.*, 24: 396.

BARRETT, N. R. (1946), "Spontaneous Perforation of the Esophagus", *Thorax*, 1: 48.

BARRETT, N. R. (1947), "Report of a Case of Spontaneous Perforation of the Œsophagus Successfully Treated by Operation", *Brit. J. Surg.*, 35: 216.

BOYD, D. P., and EYTINGE, E. J. (1951), "Perforation of the Œsophagus. Complication of Obstructing Duodenal Ulcer", *Gastroenterology*, 17: 103.

CRAM, R. W., and BRANT, D. J. (1954), "Two Cases of Spontaneous Rupture of the Œsophagus", *Canadian M. A. J.*, 71: 250.

FITZ, R. H. (1877), "Rupture of the Healthy Esophagus", *Am. J. M. Sc.*, 73: 17.

FLIPSE, M. E. (1951), "Spontaneous Rupture of the Esophagus", *Dis. Chest*, 19: 165.

GARDNER, C. M. (1949), "'Spontaneous' Rupture of the Esophagus", *Arch. Surg.*, 59: 710.

GOTT, R., JUNIOR (1933), "Spontaneous Rupture of the Esophagus with a Report of Four Cases", *Am. J. M. Sc.*, 186: 400.

HIGGINSON, J. F., and CLAGGETT, O. T. (1948), "Complete Disruption of the Esophagus. Report of a Case", *J. Thoracic Surg.*, 17: 846.

KERNAN, J. D. (1950), "Symposium on Surgical Emergencies: Perforation of the Esophagus as a Surgical Emergency", *S. Clin. North America*, 30: 405.

KINSELLA, T. J., MORSE, R. W., and HERTZOG, A. J. (1948), "Spontaneous Rupture of the Œsophagus", *J. Thoracic Surg.*, 17: 613.

KINSELLA, T. J. (1951), "Spontaneous Perforation of the Esophagus", *Am. Surgeon*, 17: 584.

MACKLER, S. A. (1952), "Spontaneous Rupture of the Esophagus. An Experimental and Clinical Study", *Surg., Gynec. & Obst.*, 95: 345.

MACKENZIE, M. (1880), "A Manual of Diseases of the Throat and Nose", Wood, Section 4: 113.

MENNE, F. R., and MORE, C. V. (1921), "Spontaneous Rupture of the Esophagus in an Infant", *Arch. Pediat.*, 38: 672.

NANSON, E. M., and WALKER, R. M. (1953), "Partial Spontaneous Rupture of the Œsophagus", *Brit. J. Surg.*, 40: 574.

OVERHOLT, R. (1952), *J. Thoracic Surg.*, 24: 385.

RUSSELL, J. T. W. (1953), "Spontaneous Perforation of the Œsophagus", *Brit. J. Surg.*, 40: 312.

SHAW, R. R. (1952), *J. Thoracic Surg.*, 24: 371.

Legends to Illustrations.

FIGURE II.—Case I: X-ray film of the chest, showing the left hydropneumothorax and air in the mediastinum.

FIGURE IV.—Case V: X-ray film of the chest, showing the left hydropneumothorax and cervical emphysema.

Reports of Cases.

EOSINOPHILIC INFILTRATION OF STOMACH AND SMALL INTESTINE.

By THOMAS FERRIER, M.B., B.S., M.R.A.C.P.,
AND
NEVILLE DAVIS, M.B., B.S., F.R.C.S.,
Brisbane General Hospital, Brisbane.

Eosinophilic infiltration of the stomach and small bowel is a condition that has been described only recently. Since 1937, when Kaijser reported the first case, less than 20 cases have been reported in the world literature. However, the condition is not so rare as this might suggest, and it is probable that it will be diagnosed more often when the syndrome becomes more widely known.

A review of the literature reveals that the condition appears to take two forms. Whether or not these two forms are different manifestations of the same disease is not known.

The more commonly reported form occurs as a diffuse thickening of the wall of the stomach, with or without involvement of the duodenum or the upper part of the jejunum (Kaijser, 1937; Barrie and Anderson, 1948; Moloney, 1949; Spencer *et alii*, 1950; Ruzic *et alii*, 1952; Orr *et alii*, 1954; McCune *et alii*, 1955; Doniach and McKeown, 1951). The thickening in the stomach becomes more pronounced towards the pylorus, where it is often sufficient to produce stenosis. The thickened, rather rigid duodenum and jejunum may resemble macroscopically that found in regional ileitis. On histological examination the mucosa is generally intact. The thickening is in the submucosa or *lamina propria* and the muscle coats, the characteristic feature being the presence of a large number or sheets of eosinophile leucocytes throughout the affected tissues. In addition there may be hypertrophy of the muscular layers. In nearly all the reported cases with the diffuse type of lesion there has been an increased number of eosinophile cells in the peripheral blood, sometimes as high as 60%.

Less commonly the condition takes the form of a localized granuloma (Vanek, 1949; Herrera and de la Guardia, 1948; Polayes and Krieger, 1950). The lesion in nearly all of these cases has been in the pyloric region. It usually occurs as a polypoid tumour-like mass and can give rise to intestinal obstruction. The lesion is easily mistaken for carcinoma. On histological examination the mass is usually in the submucosa and is formed mainly by granulation tissue with an intense eosinophilic infiltration. One case (Polayes and Krieger) has been described in which there was a localized lesion in the upper part of the jejunum involving the whole thickness of the bowel wall, and Pound (1956) has examined a specimen from a case in which there was a polypoidal eosinophile granuloma in the ileum about three feet from the ileo-caecal valve. This had caused intestinal obstruction. Eosinophilia in the peripheral blood is not a feature of the cases in which the lesion is a localized granuloma.

The ætiology of both the forms is obscure. Allergy has been invoked, especially in view of the eosinophilia. However, in less than 20% of the cases of the diffuse type of lesion and in none of the cases of localized granuloma has there been demonstrated a possible relationship between an allergen and the occurrence of symptoms.

The symptoms vary, as would be expected in a condition which varies in form and in the part of the gastro-intestinal tract which it involves. Pain is a constant feature. It may be mid-abdominal colic or epigastric pain which is frequently mistaken for that of peptic ulcer. There is often a history of recurring episodes of pain extending over years. As the condition is prone to cause gross thickening of the pylorus, it can give the clinical and radiological picture of pyloric stenosis. The thickened pylorus and especially the localized granuloma will often suggest a carcinoma to the radiologist. Vomiting is common, and the vomitus may be blood-stained. There is often diarrhœa, and the motions may contain altered blood.

The prognosis in the untreated case is difficult to assess, because in the majority of cases the lesions have been resected. The history is that of a relapsing lesion. In at least two cases (Moloney, 1949; Ruzic *et alii*, 1952) in which a biopsy was taken and the disease process left *in situ*, no further symptoms occurred. In the case described by Orr *et alii* (1954), laparotomy was performed on four occasions, and the lesion in the upper part of the small bowel had diminished considerably between the third and fourth operations.

The treatment in the past has been by partial gastrectomy in nearly all cases in which there has been a gastric lesion. In some cases this was performed because of pyloric stenosis, and in others because the condition was suspected to be carcinoma both clinically and at operation. In one case (Orr *et alii*, 1954) ACTH was given for a recurrence of symptoms with immediate relief.

We should like to report a further case which falls into the category of diffuse eosinophilic infiltration of the stomach and upper part of the intestine.

Clinical Record.

S. had never suffered from any disease commonly attributed to allergy. However, his father suffered from asthma. S. was well until the age of twelve years, when he began to experience recurrent bouts of peri-umbilical colicky pain, often associated with diarrhœa. These occurred each year about the Christmas holidays, and he would spend up to four weeks in bed. When he was aged sixteen years an operation to repair a left inguinal hernia was performed, after which he remained free of the recurring bouts of pain for two years. However, at the age of seventeen years he again suffered the attacks of peri-umbilical colic. This time they occurred nearly every day. Each episode of colic lasted up to five minutes. The bouts bore no relation to meals and were not relieved by foods, alkaline powders or milk. At this stage vomiting was not a feature, but he passed occasional watery stools. When he was aged about eighteen years (in 1951), he suffered a severe bout of abdominal pain and was admitted to a private hospital. Laparotomy was performed by Dr. J. A. Emmett, who reported that there was gross thickening of the jejunum resembling that seen in Crohn's disease. The appendix, which was normal on macroscopic examination, was removed, and a biopsy was taken of the wall of the jejunum. The pathologist at the time reported that in the wedge of tissue from the jejunum there was an extremely dense infiltration of eosinophile leucocytes amongst a background of large, pale cells. Examination of the lymph node revealed some mild inflammatory changes, and there was dense eosinophilic infiltration. In the appendix there were changes of old inflammation. On the basis of these findings the pathologist suggested the diagnoses of (i) eosinophilic leuchæmia, (ii) tropical eosinophilia and (iii) eosinophilic granuloma. The patient had no further attacks of pain for twelve months after this operation. Dr. Emmett stated that since then every blood count had shown an eosinophilia of up to 30%. The pain then recurred with exactly the same characteristics. This time the patient was treated with penicillin and streptomycin. No further symptoms occurred for two years.

The patient, now aged twenty-three years, was admitted to the Brisbane Hospital on October 22, 1955, suffering from a recurrence of the bouts of pain which had commenced four weeks previously. His private doctor had had a barium meal and "follow through" X-ray examination performed on him on October 14, 1955. No lesion was seen in the stomach or duodenal cap. The duodenum appeared a little dilated, with coarsening of the mucosal pattern. There was some clumping of the barium in the small bowel. He had been treated with oxytetracycline for eighteen days without relief of symptoms but with the occurrence of severe diarrhœa. He had not noticed any blood in his stools. He had commenced to vomit the night before his admission to hospital and noticed that

the vomitus was streaked with blood. His appetite had diminished and he had lost two stone in weight in the last four weeks.

Clinical examination of the patient on his admission to hospital revealed no gross abnormality, and he was considered to have an incomplete high small bowell obstruction. However, a flat X-ray picture of the abdomen revealed no gaseous distension and he settled down rapidly on a fluid diet and sedation. Three days later he was feeling well, but symptoms recurred on the tenth day after his admission to hospital. He had a severe bout of peri-umbilical colic, vomited and suffered watery diarrhœa. During this period of observation his temperature never rose above 99·6° F. Radiological examination of the chest revealed that the lung fields were clear, but there was a slight increase in vascular markings. Examination of the blood showed that the hæmoglobin value was 15·5 grammes *per centum* and the white cells numbered 13,000 per cubic millimetre. The differential white cell count gave the following findings: neutrophile cells 61%, lymphocytes 17%, eosinophile cells 21% and basophile cells 1%. The platelets and red cells were normal in the stained film. Examination of the fæces by the benzidine test showed that occult blood was present, no pathogens were grown on culture, and no ova, cysts or parasites were found in two specimens examined. A Leishmann's stain revealed numerous red cells, but no eosinophile leucocytes were noted.

Because of the persistence of the symptoms, laparotomy (N.C.D.) was performed on November 4, 1955, the abdomen being entered through a high left paramedian incision. The first foot of the jejunum was diffusely thickened, but not greatly so. Dr. Emmett, who had performed the previous laparotomy, attended this operation and remarked that the bowel wall was much less thickened than at the operation six years previously. Enlarged fleshy lymph nodes were seen in the mesentery, and these decreased in size as the ileum was approached. The vessels in the mesentery were dilated, although the bowel wall appeared paler than usual. While the abdomen was open the jejunum was the site of very strong peristaltic contractions. There was pronounced thickening of the pylorus, which felt almost cartilaginous in consistency. The tiny vessels of the pyloric region stood out against a pale background. There was no evidence of a peptic ulcer, the rest of the stomach and duodenum appearing normal. The remainder of the small and large bowel, and the gall-bladder, liver, spleen, pancreas and both kidneys were examined without the detection of any abnormality. An enlarged mesenteric lymph node was removed for biopsy and the abdomen was closed.

Microscopic examination of sections of the lymph node (Figure I) showed that there was hyperplasia of the reticulo-endothelial cells of the sinusoids. The medulla was hyperplastic, and numerous plasma cells were seen. Reaction centres were numerous and large. Throughout the sinusoids there were large numbers of eosinophile leucocytes, and eosinophile cells were present in smaller numbers in the tissue of the medulla.

Review of the sections taken in 1951 showed that the wedge of tissue from the jejunum consisted only of *tunica serosa* and the outer part of the *tunica muscularis*. The serosal layer was much thickened, and consisted of cellular vascular granulation tissue (Figure II), with swollen pale cells, and heavily infiltrated with eosinophile leucocytes (Figure III). In some areas there were solid sheets of the latter cells. This granulation tissue infiltrated with eosinophile cells extended into the muscle layer (Figure III) between bundles of muscle fibres. The muscle fibres gave the impression of being larger than usual, but there was insufficient tissue to determine whether the muscle was hypertrophied. The lymph nodes taken in 1951 showed prominent hyperplasia of the reticulo-endothelial cells (Figure IV), the sinusoids being packed with large pale cells. The medulla was hyperplastic, with numerous plasma cells, and many prominent reaction centres were present (Figure IV). There was an intense infiltration of eosinophile leucocytes in the sinusoids (Figure IV), and a lesser number of these cells were scattered in the medullary tissue. In the outside fat were scattered groups of lymphocytes and eosinophile leucocytes around small blood vessels, but changes in the vessels were not noted. No parasites could be demonstrated in the tissues. Examination of the appendix revealed changes of old inflammation, but there was no significant infiltration of the appendix with eosinophile cells. The changes in the lymph node removed in 1951 were much more intense than in the recent section.

In the early post-operative period the patient complained of severe diarrhœa, and suffered some bouts of abdominal colic.

On November 19 a course of ACTH was commenced in the dosage of 40 units per day of long-acting ACTH preparation, given by intramuscular injection for fourteen days. Immediately prior to the commencement of ACTH therapy his blood picture was as follows: the red cells numbered 3,800,000 per cubic millimetre and the hæmoglobin value was 14·1 grammes *per centum*; there were 9000 white cells per cubic millimetre, of which neutrophile cells numbered 58%, lymphocytes 33% and eosinophile cells 9%; the platelets were normal.

On November 22 his absolute eosinophile cell count was 450 per cubic millimetre.

His symptoms were relieved after the institution of ACTH therapy and he was free of pain and diarrhœa till his discharge from hospital on December 3.

He was examined as an out-patient on January 3, 1956, and said that he was very well and free of all pain. A blood count on that day gave the following result: the hæmoglobin value was 14·9 grammes *per centum*; examination of a smear revealed that the platelets and red cells were normal and that the number of leucocytes appeared increased; neutrophile cells numbered 49%, lymphocytes 32%, eosinophile cells 17%, and basophile cells 2%.

A relapse occurred on January 22, when he was readmitted to hospital complaining of typical mid-abdominal colic and vomiting. His symptoms were relieved by pethidine injections, but the attacks of pain recurred each day. Intradermal skin tests were performed, and he was found to be sensitive to milk, pork, wheat and lamb. The patient thought that some of his attacks of pain might have been precipitated by milk, but on one day he had no milk and yet the pain still occurred.

ACTH treatment was commenced on January 26 at a dosage of 40 units given intramuscularly each day. Serial blood counts were performed with the results shown in Table I.

TABLE I.

Serial Blood Counts: ACTH Therapy Commenced on January 26, 1956.

Date (1956).	Leucocytes per Cubic Millimetre).	Eosinophile Cells.
January 24 ..	14,800	46%
January 26 ..	12,000	20%
January 27 ..	10,000	10%
January 28 ..	8000	12%
January 30 ..	6800	4%
January 31 ..	8800	11%
February 1 ..	10,600	5%

From the commencement of ACTH therapy the patient became completely asymptomatic, and he was discharged from hospital, well, on February 4.

Discussion.

Three things are worthy of comment in this case. First, a gross lesion produced by eosinophilic infiltration of the stomach and small bowel can resolve spontaneously, and this must be remembered when treatment is being considered.

Secondly, ACTH appeared to give immediate relief of symptoms. A similar result was obtained in the case reported by Orr *et alii*. The fact that the eosinophile cell

count fell is of little significance, as this is the usual response to ACTH injection. Naturally in a condition prone to spontaneous remission this ACTH response may be mere coincidence. However, it is encouraging and worthy of further trials.

Finally, this case illustrates the value of white cell and differential cell counts in cases of abdominal pain of obscure ætiology. In retrospect the diagnosis in this case was reasonably certain, in view of the history of a laparotomy showing "a picture like Crohn's disease" in the upper part of the intestine and of the knowledge that the patient had persistent eosinophilia. The second laparotomy might have been avoided if we had been more conversant with the condition at that time.

Suggested Management in Future Cases.

A parasitic infection should be excluded first in the examination of any patient who suffers abdominal pain and is found to have eosinophilia. If these investigations give negative results, a careful history should be taken and skin tests performed to detect any allergic factor. Exclusion of such an allergen from the diet may relieve the symptoms. However, if a diagnosis of eosinophilic infiltration of the stomach or small intestine is suspected, ACTH is worth a trial during exacerbations of symptoms and may prove to be the most effective treatment.

We think that in our present state of knowledge the least necessary operative procedure should be performed. Laparotomy will often be necessary to confirm the diagnosis or to relieve complications. If the condition can be recognized at operation and if there are no complications, a biopsy should be taken and the abdomen closed. If pyloric obstruction exists, a gastro-jejunostomy would be justified. Lesions indistinguishable macroscopically from carcinoma would have to be dealt with by resection unless examination of a frozen section established the diagnosis.

Summary.

1. A case is reported of eosinophilic infiltration of the stomach and the upper part of the small bowel.

2. The condition can take the form of diffuse infiltration or a localized granuloma. It often produces pyloric obstruction. Its characteristic histological feature is massive infiltration of the affected tissues by eosinophile cells.

3. In most cases there is pronounced eosinophilia in the peripheral blood.

4. Recurrent abdominal pain of an obscure nature is the most common symptom.

5. The condition tends to resolve spontaneously.

6. ACTH may produce relief of symptoms.

7. Operation should be limited to that necessary to allow a diagnosis to be made and to relieve complications.

Acknowledgements.

We wish to thank Dr. J. A. Emmett, who referred the patient, for his cooperation, Dr. A. Pound, Director of Pathology at the Brisbane Hospital, for his interest and help with pathological examinations, and Dr. A. D. D. Pye for permission to publish case records.

References.

BARRIE, H. J., and ANDERSON, J. C. (1948), "Hypertrophy of the Pylorus in an Adult with Massive Eosinophil Infiltration and Giant Cell Reaction", *Lancet*, 2: 1007.

DONIACH, I., and MCKEOWN, K. C. (1951), "A Case of Eosinophilic Gastritis", *Brit. J. Surg.*, 39: 247.

HERRERA, J. M., and DE LA GUARDIA, J. (1943), *"Un raro caso de eosinofilia gastro-intestinal motivadora de un cuadro organico de estenosis pilorica"*, *Arch. Hosp. Santo Tomás*, 3: 19; quoted by Orr, I. M., *et alii*, *loco citato*.

KAISER, R. (1937), *"Über Hämangiome des Tractus gastro-intestinalis"*, *Arch. f. klin. Chir.*, 187: 351; quoted by Vanek, J., *loco citato*.

MCCUNE, W. S., GUSACK, M., and NEWMAN, W. (1955), "Eosinophilic Gastroduodenitis with Pyloric Obstruction", *Ann. Surg.*, 142: 150.

MOLONEY, G. E. (1949), "Pyloric Hypertrophy with Eosinophilic Infiltration", *Lancet*, 1: 412.

ORR, I. M., MILLER, A. A., and RUSSELL, J. Y. W. (1954), "Eosinophilic Infiltration of the Stomach and Bowel", *Postgrad. M. J.*, 30: 485.

POLAYES, S. H., and KRIEGER, J. L. (1950), "Eosinophilic Granuloma of the Jejunum", *J.A.M.A.*, 143: 549.

POUND, A. W. (1956), personal communication.

RUZIC, J. P., DORSEY, J. M., HUBER, H. L., and ARMSTRONG, S. H. (1952), "Gastric Lesion of Loeffler's Syndrome—Report of a Case with Inflammatory Lesion Simulating Carcinoma", *J.A.M.A.*, 149: 543.

SPENCER, J. R., COMFORT, M. W., and DAHLIN, D. C. (1950), "Eosinophilic Infiltration of the Stomach and Bowel Associated with Pyloric Obstruction and Recurrent Eosinophilia", *Gastroenterology*, 15: 505.

VANEK, J. (1949), "Gastric Submucosal Granuloma with Eosinophilic Infiltration", *Am. J. Path.*, 25: 397.

Legends to Illustrations.

FIGURE I.—Photomicrograph of lymph node removed in 1956, showing medullary hyperplasia, prominent reaction centres and hyperplastic cells in the sinusoids. (Hæmatoxylin and eosin stain; magnification 50.)

FIGURE II.—Photomicrograph of wedge of tissue from jejunum taken in 1951, showing granulation tissue in the *tunica serosa* and extending between bundles of plain muscle in the *tunica muscularis*. (Hæmatoxylin and eosin stain; magnification 50.)

FIGURE III.—Photomicrograph of wedge of tissue from jejunum showing characteristics of granulation tissue in the *tunica serosa* and amongst the muscle bundles. Numerous eosinophile leucocytes (granules appearing black) are seen amongst the background of pale cells of the granulation tissue. (Hæmatoxylin and eosin stain; photographed to display eosinophile granules; magnification 400.)

FIGURE IV.—Photomicrograph of lymph node taken in 1951, showing medullary tissue with numerous plasma cells, and a sinusoid packed with pale cells and heavily infiltrated with eosinophile leucocytes (granules appearing black). (Hæmatoxylin and eosin stain; photographed to display eosinophile granules; magnification 400.)

AN UNUSUAL ABDOMINAL INJURY.

By ERIC M. FISHER,
Sydney.

Clinical Record.

A MALE PATIENT, aged forty-three years, was using a rotary mower on grass at his home on October 1, 1956, when he felt something hit him in the right buttock. When he felt inside his clothes he found he was bleeding freely. After entering his home he suddenly complained of pain in his left hypochondrium and then in his left shoulder. This was severe and constant and was aggravated by movement and coughing. He was sent into Parramatta District Hospital by his doctor with the diagnosis of a ruptured ulcer, presumably because of abdominal pain and rigidity and a history of indigestion and vomiting of some years' duration, with negative findings in 1953 from a barium meal X-ray examination.

On his admission to hospital, examination showed him to be a heavy, thick-set man, pale and sweating and in obvious pain; his pulse rate was 65 per minute, and his blood pressure was 135 millimetres of mercury, systolic, and 80 millimetres, diastolic. There was generalized abdominal rigidity, not very pronounced, with maximal tenderness in the left hypochondrium. There was a small punctured wound in the perineum, one inch to the right of and behind the anus, which was not bleeding. Examination per rectum was negative. Plain X-ray of the abdomen showed a large nail in the left hypochondrium (Figures I and II). Its point was upwards and it appeared to have pierced the diaphragm. No abnormal signs were found on examination of the chest.

Operation was carried out one hour after the patient's admission to hospital. When the abdomen was opened, no blood, gas, intestinal contents or odour was present. The nail was found lying free under the left cupola of the diaphragm and was removed. No rent could be felt in the diaphragm. The stomach was found to be intact; the whole colon and rectum and the bladder were examined and found to be uninjured, although there was a small rent in the pelvic mesocolon. There were a few hæmorrhagic areas in the great omentum, which was large and thick. The small intestine was passed through the fingers from

above downwards, and 10 small punctures, with no eversion of the mucosa, were found and oversewn. Search was made for the site of entry into the pelvis, but it could not be identified. The abdomen was then closed. Convalescence was uneventful.

Discussion.

The nail must have been picked up by the mower and shot, point first, like an arrow. It had entered the pelvis through the perineum, missing the urethra, bladder and rectum. It had passed upwards and to the left through the coils of small intestine in the pelvis, just touching the pelvic mesocolon, then through the great omentum in front of the transverse colon, and then in front of the stomach to the left cupola of the diaphragm. The patient was told how fortunate he was that so many important organs had escaped injury and was advised to take a ticket in the lottery. He replied that his wife had already done this.

Summary.

An unusual penetrating abdominal injury is reported.

Legends to Illustrations.

FIGURE I.—Antero-posterior film, showing foreign body.
FIGURE II.—Lateral film, showing foreign body.

LYMPHOSARCOMA OF THE OVARY.

By A. R. H. DUGGAN,
Sydney.

STANDARD text-books on pathology do not mention primary lymphosarcoma of the ovary; but Willis (1953) states that apparently lymphosarcoma can arise as a primary growth in organs which do not normally contain lymphoid tissue. Histologists deny the presence of lymphoid tissue in the normal ovary. There is no doubt that a primary growth occurring in a lymph node may metastasize to other tissues.

I do not claim that the lymphosarcoma described below was an undoubted ovarian primary growth; but the findings and subsequent history do seem to suggest it.

The growth in the ovary, either primary or secondary, is apparently rare, unless some of the tumours previously diagnosed as small round-cell tumours of the ovary are really lymphosarcomata.

In the available literature I could find only one case of "primary" ovarian lymphosarcoma described in detail, and reference to only three others. The case described in detail is that of Durfee *et alii* (1937), and the growth is supposed to be primarily ovarian because the mass in the left ovary was "by far the largest mass present", though growth was present in many other organs and nodes. I believe that this is not proof of primary ovarian lymphosarcoma.

Durfee found only two other primary ovarian lymphosarcomata in the literature, both reported by Walther, but these are not described. One other ovarian primary growth was mentioned by Sugarbaker and Craven (1940); in an article describing 196 cases of lymphosarcoma, they speak of one growth as being ovarian, but do not go into any details.

Anderson (1953) states that lymphosarcoma has been known to terminate with a leuchæmic blood picture, and that Hodgkin's disease has been associated with lymphosarcoma. When leuchæmia has been associated, the condition has been described as lymphosarcoma with a circulating metastasis. No abnormality of the blood has yet been found in the patient described below.

Lymphosarcoma in general is a disease predominantly affecting males, in the ratio of seven to three, and usually occurs around middle age. It has been mainly treated by irradiation, and the ultimate results have not been good.

Clinical Record.

Mrs. C., aged forty-six years, had had two children, the younger being aged thirteen years. She complained of frequency of micturition for three years, some urgency,

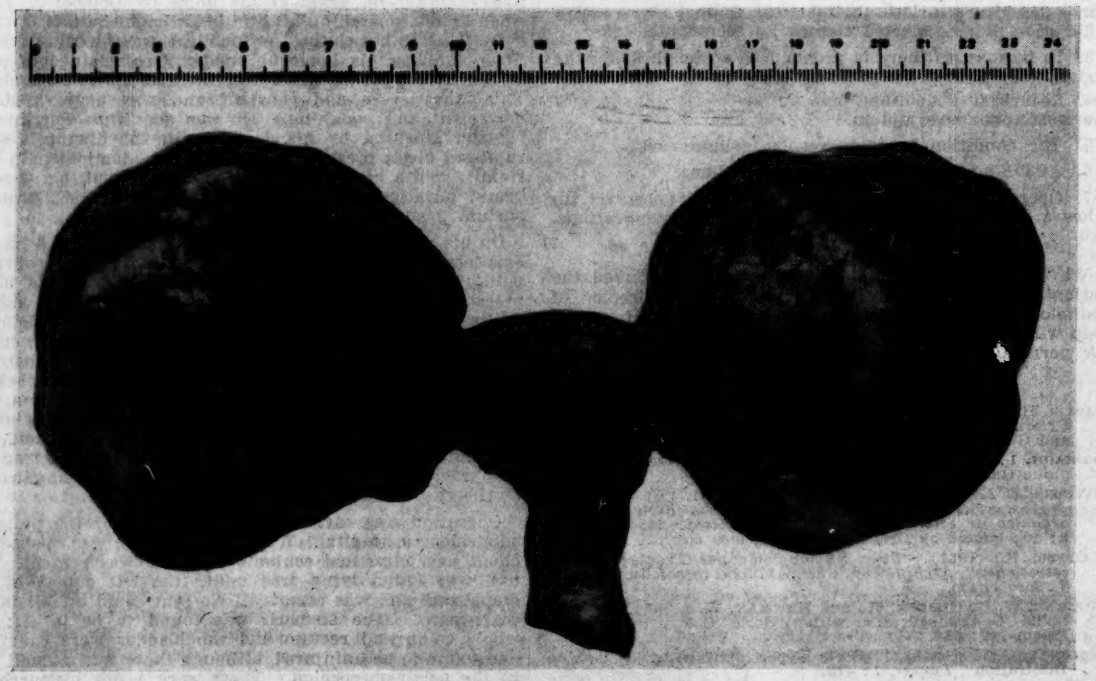


FIGURE I.
Specimen removed at operation.

and slight stress incontinence. There was a feeling of "pressure" in the lower part of the abdomen, but no actual pain. There was no vaginal discharge, and her weight had been constant and her general health good. There were no symptoms referable to the respiratory, cardio-vascular, nervous or alimentary systems. Her menstrual periods were regular, occurring every twenty-eight days and lasting three days, with moderate loss. There was slight dysmenorrhœa, and the last menstrual period had occurred two weeks before.

On examination, Mrs. C. appeared to be a normal, healthy woman. An irregular firm mass could be felt above the symphysis, extending half-way to the umbilicus; it was not tender, and was fairly mobile. On vaginal examination, a slight cystocele was present, and an irregular firm mass was found filling the pelvis and the lower part of the abdomen. The uterus was not clearly distinguishable from this mass, and the whole tumour was mobile and not sensitive. A diagnosis of uterine fibroid tumours or ovarian tumours was made.

At operation on March 17, 1955, bilateral solid ovarian tumours were found; the uterus appeared normal, there was no ascites, the peritoneum was not involved, and no lymph glands were palpable. Total hysterectomy and double salpingo-oophorectomy were performed (Figure I). Convalescence was normal. No irradiation was employed.

Dr. C. R. Palmer made the pathological examination. His report is as follows:

> *Macroscopic.*—The specimen consists of a uterus with both tubes and greatly enlarged ovaries attached. Each ovarian tumour measured approximately 9·0 cm. by 8·0 cm. by 5·0 cm. The surfaces were smooth except for a short tear in the surface of the right tumour.
>
> *Microscopic.*—In all sections examined from both ovaries the tumour is similar, being composed of small more or less round cells with little or no visible cytoplasm. There are areas in which the cells are large and these somewhat resemble the follicles in a lymph node. A few scattered cells with abundant cytoplasm like histiocytes are present. There are moderate numbers of mitoses. No mucin has been found. The reticular pattern is variable. [Figures II and III.] I think the tumours are lymphosarcoma, and most of the pathologists who have seen the sections agree with this view, though such a lesion would undoubtedly be a rarity.

The patient was examined on November 28, 1955, and there were no signs of recurrence in the abdomen or lungs. No enlarged glands were palpable.

In June, 1956, she felt well, and her weight was increasing. No abnormality was detected in her abdomen or pelvis, and there were no enlarged glands. A blood count taken at this time showed the hæmoglobin value to be 13·3 grammes per 100 cubic centimetres. The leucocytes numbered 6300 per cubic millimetre, distributed as follows: neutrophile cells 58%, eosinophile cells 1%, lymphocytes 37%, monocytes 4%. The red cells showed only slight variations in size and were normal in appearance. Leucocytes of both the granular and mononuclear series were normal in character, and no immature forms were seen. Platelets were plentiful.

In March, 1957, two years after operation, the patient was well, no abnormality could be found in her abdomen or pelvis, and there were no palpable glands.

References.

ANDERSON, W. A. D. (1953), "Pathology", 2nd Edition: 940.

DURFEE, H. A., CLARK, B. F., and PRESS, J. H. (1937), "Primary Lymphosarcoma of Ovary. Report of a Case", *J. Cancer*, 30: 567.

SUGARBAKER, E. A., and CRAVEN, L. F. (1940), "Lymphosarcoma. A Study of 196 Cases", *J.A.M.A.*, 115: 17.

WILLIS, R. A. (1953), "Pathology of Tumours", 2nd Edition: 768.

FUNGAL ENDOCARDITIS COMPLICATING STAPHYLOCOCCAL ENDOCARDITIS.

By N. J. NICOLAIDES,

Department of Pathology, Brisbane Hospital, Brisbane.

Most cases of fungal endocarditis reported in the literature have been caused by an organism which has been classified as a Candida. Four cases have been reported in which the organism has been considered to be an Aspergillus. In two of these cases the fungus was not grown on culture, but was classified as an Aspergillus from the morphological appearances of the fungus in the tissues (Zimmermann, 1950). In the other two cases an Aspergillus was grown on culture from material obtained at autopsy (Welsh and Buchness, 1955; Kirschstein and Sidransky, 1956).

In this report a further case of fungal endocarditis is recorded. The fungus is considered to be an Aspergillus on its morphological appearances in the tissue. The infection occurred in a young woman who was already seriously ill with endocarditis due to a coagulase-positive *Staphylococcus aureus*, and who was receiving massive doses of antibiotics both orally and intravenously.

Clinical Record.

A married woman, aged thirty-two years, was admitted to hospital on April 14, 1955. She had had an attack of rheumatic fever when she was aged seven years. She had suffered from dyspnœa on exertion over a number of years, and had developed cardiac failure in 1953 when she was pregnant. Bilateral salpingectomy was performed after the baby was born.

On her admission to hospital she complained of severe colic in her right loin, of approximately three hours' duration, which had prevented her from lying down or sitting down. She had vomited twice and had been sweating profusely since the onset of the pain.

On examination, she was pale, sweating and in pain. Her temperature was 103° F. She had a regular pulse with a rate of 104 per minute, and her systolic blood pressure was 150 millimetres of mercury and her diastolic blood pressure 90 millimetres. On auscultation of her heart sounds, a loud systolic murmur was heard which obscured the first sound at all areas.

On examination of her abdomen, she was found to have muscular guarding below the right costal margin, and tenderness was present in the right loin. Microscopic examination of her urine revealed 16 leucocytes and a number of red cells per high-power field. Laparotomy was performed, as acute obstructive cholecystitis could not be excluded. However, the possibility that the attack might be due to embolic phenomena in the right kidney was mentioned. At laparotomy a large, tense right kidney was found, and a small amount of free fluid was present in the peritoneal cavity. She remained febrile over the next few days, her temperature ranging from 99° F. in the mornings to 104° F. in the evenings, in spite of the oral administration of chloramphenicol, 250 milligrammes every six hours. Later, a number of red, indurated, painful areas were noticed on her hands, and the diagnosis of infective endocarditis was made.

Blood cultures were attempted on three occasions during the next few days, and a coagulase-positive *Staph. aureus* was grown. She was given oxytetracycline by mouth in a dosage of 500 milligrammes every six hours, and chloramphenicol by mouth in a dosage of 250 milligrammes every six hours. She was also given 1,000,000 units of penicillin by intramuscular injection every three hours, and one gramme of streptomycin intramuscularly twice a day. Penicillin therapy was stopped when in-vitro sensitivity tests revealed that the organism was insensitive to penicillin, but was sensitive to streptomycin, chloramphenicol and oxytetracycline.

On May 11, twenty-eight days after the onset of the illness, she complained of a pain in her chest. A pericardial

friction rub was now audible on auscultation, and it was thought that she had developed infective pericarditis. She remained febrile and the chest pain persisted. On May 24, forty-one days after the onset of the illness, the plan of therapy was changed to the intravenous administration of oxytetracycline in glucose saline solution, one gramme every four hours, via an in-dwelling polythene catheter inserted into the left median cubital vein. She was now showing signs of increasing cardiac failure, and it was thought that a pericardial effusion was developing. A pericardial tap was attempted, but was stopped, as a free flow of blood-stained fluid was obtained, and it was thought that the ventricle had been punctured. No organism was grown in blood cultures attempted on May 20 and again on May 30.

On June 3 it was noticed that excessive systolic pulsation had developed over her precordium and increased arterial pulsation in her neck. This was thought to be due to rupture of an aortic valve cusp. Over the next few days the patient felt somewhat improved, although she was now faintly jaundiced. On June 8 she became drowsy and could be roused only with difficulty. The jaundice had deepened, and a coarse tremor of her right forearm developed. However, both plantar reflexes remained flexor. She died a few hours later, at 11.45 p.m. on June 8.

Of the investigations performed, the blood cultures only will be included here. Blood cultures grew a coagulase-positive *Staph. aureus* on April 25, April 26, May 5, May 6 and May 7. The staphylococcus did not grow in cultures attempted on May 20, May 30 and June 7. No fungus was observed to grow in the blood cultures.

Necropsy Findings.

Autopsy was performed approximately eleven hours after death. The relevant findings only will be described.

On examination of the heart, both the visceral and parietal pericardial layers were grossly thickened, and there were numerous organizing bulky fibrinous adhesions binding both layers together. Between the adhesions there were encysted collections of brownish fluid (Figure I).

FIGURE I.
Photograph showing gross pericarditis.

The myocardium of both ventricles was of normal thickness, and no obvious abscesses were seen. The pulmonary and tricuspid valves were normal. The mitral valve cusps were thickened and the *chordæ tendineæ* were somewhat shortened; the appearance suggested that the valve was incompetent. A large, friable, greenish vegetation was attached to the auricular side of the valve at the base of the anterior cusp. This vegetation measured 1·5 by 1·5 by 1·0 centimetres. At the base of the left posterior cusp of the aortic valve and involving the adjacent wall of the aorta were the remains of a similar vegetation to that on the mitral valve. Extending upwards from the base of the involved cusp for approximately 0·5 centimetre was a linear perforation of the aorta. A probe could be passed through the perforation into a collection of blood and blood clot lying outside the aorta (Figure II). From here blood had tracked during life into the pericardial sac, with the production of the pericarditis described earlier.

The spleen was enlarged and weighed 360 grammes. It was soft and flabby in consistency, and the splenic parenchyma was congested. There was a small, yellowish-white infarct measuring 0·6 by 0·5 by 0·5 centimetres at the lower pole.

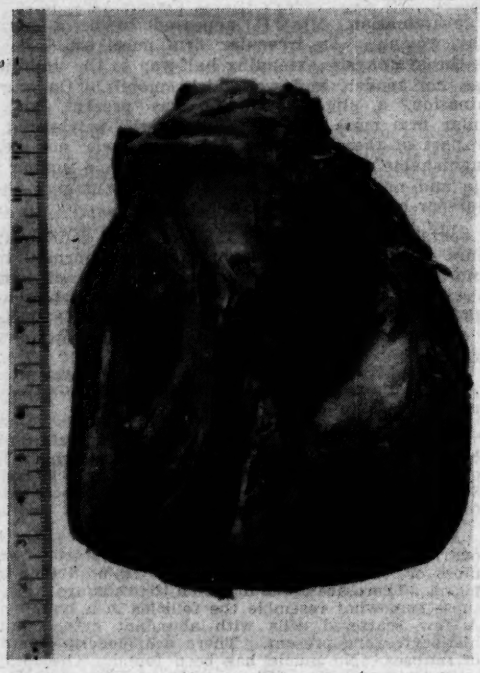


FIGURE II.
Photograph showing the remains of the vegetation at the base of the mitral valve and the perforation in the aortic wall at the base of the left posterior cusp.

The liver weighed 3000 grammes. It was soft in consistency, and its external and cut surfaces had a yellowish colour. There was no macroscopic evidence of abscess formation, and no evidence of obstruction to the common bile duct.

Both kidneys were enlarged and flabby in consistency. The right kidney was removed with difficulty, as there were adhesions of the capsule to the perinephric fat. There was a large, recently healed scar near the lower pole of the kidney. The cut surface of the kidney had a greenish-yellow colour, and on close inspection a number of small yellowish abscesses were seen scattered in the pyramids and in the cortex. The left kidney was similar in appearance, but there were no capsular adhesions.

External examination of the brain revealed a number of small brownish areas which were thought to represent small infarcts. They were mainly present over the inferior surfaces of both temporal lobes. No macroscopic evidence of abscess formation was seen on examination of sections. The cerebral vessels appeared to be free of gross atheroma.

When the veins of the left arm were examined, the median cubital vein was found to be partially thrombosed. The thrombus involved the basilic vein and extended into the distal portion of the axillary vein. The walls of the veins were thickened and greyish-white in appearance. The polythene catheter, which had been inserted into the median cubital vein, had been removed just prior to the patient's death and was not available for examination.

Histological Findings.

Attached to the mitral valve was a fibrinous vegetation which contained innumerable fungal elements (Figure III). Many of the fungal elements were buried deep in the substance of the valve. The valve showed evidence of vascularization, and much dense collagenous tissue was present. Gram staining did not reveal any organisms resembling staphylococci in this vegetation. Examination of a section taken through the base of the left posterior cusp of the aortic valve and the adjacent aortic wall revealed similar but more extensive involvement by the fungus. Numbers of Gram-positive organisms which resembled staphylococci were also demonstrated. Scattered through the myocardium were a number of minute abscesses containing necrotic muscle fibres, polymorphonuclear leucocytes and mononuclear cells. In one of these abscesses fungal elements were seen. Organizing pericarditis was present, and much fibrin and free blood was present between the pericardial layers. Septate hyphæ and spores of the fungus were present on the surface of the visceral pericardium, and appeared to be lying free in the remnants of the pericardial cavity.

Examination of the liver revealed widespread fatty infiltration, especially in the peripheral parts of the lobule. Many of the portal tracts were heavily infiltrated with wandering cells which were mainly polymorphonuclear leucocytes. In some areas minute abscesses had formed, and some of these contained the fungus.

The spleen was found to contain an old infarct. There was an increase in the size of the Malpighian follicles. No fungus was seen in the spleen.

Scattered throughout the kidneys were many small abscesses containing polymorphonuclear leucocytes, mononuclear cells and the septate hyphæ and spores of the fungus. They were situated mainly in the cortex. Many of these abscesses appeared to have originated in glomeruli, and although some were confined to glomeruli, others had spread into the surrounding tissues. Some of the glomeruli containing the fungus showed surprisingly little cellular exudate (Figure IV). Fungal elements and nuclear debris were also seen in the lumina of the convoluted tubules (Figure V). One of the sections contained a fairly old organized infarct. The appearances were those of focal embolic nephritis due to the fungus.

Many small abscesses were seen scattered through both the grey and the white matter of the brain. These abscesses contained polymorphonuclear leucocytes, mononuclear cells and the septate hyphæ and spores of the fungus (Figure VI). Near the surface were some small areas of cerebral infarction, most of which were at least three to four days old. These small cortical infarcts appeared to have resulted from the involvement of small arteries in the small brain abscesses described above.

The distal end of the left axillary vein showed histological evidence of acute inflammation, and the wall was heavily infiltrated with polymorphonuclear leucocytes. The lumen of the vein was almost completely occluded by an organizing thrombus, in which fungal elements could be seen (Figure VII).

Examination of the lymph nodes revealed hyperæmia only.

The fungus was thus seen in vegetations on the mitral and aortic valves, in the pericardial cavity, in the axillary vein thrombus, and in abscesses in the myocardium, kidneys, brain and liver. The fungus had the same characteristics in all sites, hyphæ and spores being present. The hyphæ were large and septate and showed considerable lateral branching (Figure VIII). In the vegetations the hyphæ were often arranged in a radial fashion. The spores were large and the largest measured approximately 7μ in diameter. The morphology of the fungus was demonstrated fairly well by staining with hæmatoxylin and eosin; however, the detail was best demonstrated by the use of the periodic acid Schiff stain. Staining by the Giemsa method also produced good results. The results obtained with the Brown-Brenn technique were unsatisfactory as regards morphological detail when compared with those obtained with the Schiff reagent stain. These histological findings strongly suggest that the fungus belongs to the genus Aspergillus.

The other organs appeared histologically normal.

Discussion.

This is the case of a woman who had a previous history of rheumatic fever, and who subsequently, whilst pregnant, developed cardiac failure. After she had been well for two years, acute staphylococcal septicæmia developed, presumably due to endocarditis. She was treated vigorously with antibiotics by mouth as well as by intravenous administration, and blood cultures ceased to yield *Staph. aureus*. Her condition improved temporarily, but soon deteriorated, and she died after an illness lasting approximately nine weeks.

Autopsy revealed endocarditis with vegetations in which was growing a fungus-like organism. In the vegetation near the aortic valve numbers of staphylococcus-like organisms were also present. Widespread embolic manifestations had occurred, and the fungus was seen in the kidneys, liver, myocardium and brain. However, no staphylococcus-like organisms were seen in these sites.

The morphological appearance of the fungus in the tissues was most suggestive of an Aspergillus. The main fungi pathogenic for man are Cryptococcus, Histoplasma, Candida, Mucor, Actinomyces and Aspergillus. However, the presence of hyphæ rules out the possibility that the organisms were Cryptococcus or Histoplasma. The hyphæ of Actinomyces are much smaller than those of Aspergillus, Candida and Mucor, and spore forms are not seen. Mucor is easily distinguished from Candida and Aspergillus, since its hyphæ, although large and branching, are not septate. Thus the greatest difficulty is to distinguish Aspergillus from Candida. Candida is distinguished from Aspergillus in that its hyphæ are much smaller than those of Aspergillus and there is little lateral branching. It would appear, then, from the foregoing description of the morphology of the fungus, that it was most probably an Aspergillus (Zimmerman, 1950; Kade and Kaplan, 1955; Kirschstein and Sidransky, 1956).

It is most probable that the mode of entrance of this organism was by way of the left cubital vein, which had been catheterized with a polythene tube for the administration of the necessary intravenous medication for many days prior to the patient's death. At autopsy the vein was inflamed and partially occluded by an organizing thrombus containing the fungus.

In two previous case reports of fungal endocarditis the patients were given corticotrophin over a considerable period of time (Welsh and Buchness, 1955; Kirschstein and Sidransky, 1956). Kirschstein and Sidransky suggested that the anti-inflammatory effect of this drug may have been a factor in the production of an environment favourable to the growth of the fungus. However, no corticotrophin was administered in the present case, nor was any given in the cases of fungal infection described by Zimmerman (1950), by Wikler *et alii* (1942), by Joachim and Polayes (1940) or by Grekin *et alii* (1950).

In many of the cases of fungal endocarditis reported, massive doses of antibiotics had been given, and it was suggested that this was probably a factor in the development of these infections (Zimmerman, 1950; Caplan, 1955; Welsh and Buchness, 1955; Kirschstein and Sidransky, 1956). Some authors have suggested that chlortetracycline and penicillin may enhance the growth and pathogenicity of *Candida albicans* (Huppert *et alii*, 1953; Foley and Winter, 1953). In the case reported here the patient had received massive doses of antibiotics over a prolonged period, and by the intravenous as well as by the oral route. However, in some of the cases reported the patients did not receive antibiotics at all (Joachim and Polayes, 1940; Wikler *et alii*, 1942; Zimmerman, 1950—Case I).

Duhig and Mead (1951) reported four cases of systemic mycosis due to *C. albicans* in children very ill with gastroenteritis. Three of these children had received penicillin, but only in small doses as compared to the amounts given today; but all the children had received over prolonged periods intravenous medication with glucose saline.

Fungal endocarditis has also occurred in drug addicts who gave themselves the drug by intravenous injection (Joachim and Polayes, 1940; Wikler *et alii*, 1942; Zimmerman, 1950).

It would appear, therefore, that the common factor operating in these cases of fungal infection is the receipt of numerous intravenous injections by persons in a debilitated state.

Summary.

A case of fungal endocarditis presumably due to an Aspergillus is reported.

The mode of entrance of the fungus was most likely via the left cubital vein.

The infection occurred in a woman already seriously ill with staphylococcal endocarditis.

Circumstances likely to be predisposing factors towards this condition are discussed.

Acknowledgements.

I should like to express my thanks to Dr. A. W. Pound, Director of the Department of Pathology, for his valuable criticism in the preparation of this paper. I should also like to thank Dr. A. D. D. Pye for his permission to use the hospital records.

References.

CAPLAN, H. (1955), "Monilial (Candida) Endocarditis following Treatment with Antibiotics", *Lancet*, 2: 957.

DUHIG, J. V., and MEAD, M. (1951), "Systemic Mycosis due to Monilia Albicans", M. J. AUSTRALIA, 1: 179.

FOLEY, G. E., and WINTER, W. D. (1949), "Increased Mortality following Penicillin Therapy of Chick Embryo Infected with Candida Albicans var. Stellatoidea", *J. Infect. Dis.*, 85: 268.

GREKIN, R. H., CAWLEY, E. P., and ZHEUTLIN, B. (1950), "Generalized Aspergillosis: Report of a Case", *Arch. Path.*, 49: 387.

HUPPERT, M., MACPHERSON, D. A., and CAZIN, J. (1953), "Pathogenesis of Candida Albicans Infection following Antibiotic Therapy", *J. Bact.*, 65: 171.

JOACHIM, H., and POLAYES, S. H. (1940), "Subacute Endocarditis and Systemic Mycosis (Monilia)", *J.A.M.A.*, 115: 205.

KADE, H., and KAPLAN, L. (1955), "Evaluation of Staining Techniques in the Histologic Diagnosis of Fungi", *Arch. Path.*, 59: 571.

KIRSCHSTEIN, R. L., and SIDRANSKY, H. (1956), "Mycotic Endocarditis of the Tricuspid Valve due to Aspergillus Flavus: Report of a Case", *Arch. Path.*, 62: 103.

WELSH, R. A., and BUCHNESS, J. M. (1955), "Aspergillus Endocarditis, Myocarditis and Lung Abscess", *Am. J. Clin. Path.*, 25: 782.

WIKLER, A., WILLIAMS, E. G., DOUGLASS, E. D., EMMONS, C. W., and DUNN, R. C. (1942), "Mycotic Endocarditis: Report of a Case", *J.A.M.A.*, 119: 333.

ZIMMERMAN, L. E. (1950), "Candida and Aspergillus Endocarditis", *Arch. Path.*, 50: 591.

Legends to Illustrations.

FIGURE III.—Photomicrograph showing fungal elements in the vegetation on the mitral valve. (Hæmatoxylin and eosin stain, ×75.)

FIGURE IV.—Photomicrograph showing fungal elements present in a renal glomerulus. (Periodic acid Schiff stain, ×500.)

FIGURE V.—Photomicrograph showing fungal elements in a renal tubule. (Periodic acid Schiff stain, ×500.)

FIGURE VI.—Photomicrograph showing fungal elements in a brain abscess. (Periodic acid Schiff stain, ×500.)

FIGURE VII.—Photomicrograph showing the fungus present in the axillary vein thrombus. (Giemsa stain, ×100.)

FIGURE VIII.—Photomicrograph showing some branching septate hyphæ arranged in a radial fashion and some spores of the fungus (Periodic acid Schiff stain, ×1000.)

Reviews.

Adrenal Function in Infants and Children: A Symposium. Edited by Lytt I. Gardner, M.D.; 1956. New York, London: Grune and Stratton. 8½" × 5½", pp. 231, with illustrations. Price: $6.75.

THIS volume presents the proceedings of a symposium held in Syracuse, New York, on November 3 and 4, 1954, in which were presented 15 separate papers with their attendant discussion. A wide range of subjects was covered, of which several are of special interest to the pædiatrician.

Edna Sobel, from The Children's Cancer Research Foundation, Boston, reported on the influence of testosterone and cortisone on growth. Since both these drugs are used in long-term therapy it has become desirable to know what are their effects on growth. In the testosterone experiments 27 children, aged from five to ten years, were given graded doses over six months. Cortisone was administered to four children with congenital adrenal hyperplasia. The results of both studies suggest that both testosterone and cortisone may be considered growth inhibitors. Testosterone accelerates skeletal maturation as well as skeletal growth, and this could lead to distinct stunting in height.

Measurements of blood ACTH and 17-hydroxycorticosteroid levels in children with rheumatic fever by Kelley and his staff at the Department of Pediatrics, University of Utah, suggest that there is definite evidence of abnormal pituitary-adrenal cortical function except during the first week of the disease; this, they hold, is the scientific justification for the administration of cortisone to the child with rheumatic fever.

Klein and Rovnanek, from the Department of Pediatrics, University of Pittsburg, reported on the ACTH response in newborn infants. They pointed out that their tests were "quantitative measurements of certain colour reactions in the serum"; but the identity of the hormones causing this reaction is not clear. The reaction is obtained in adults, children and newborn infants after the administration of ACTH. They showed that the newborn infant is capable of responding to the administration of large doses of ACTH given intravenously with a good elevation of the level of circulating corticoid. They raised the following two interesting questions: Under clinical stress, does the newborn pituitary release enough ACTH to stimulate the adrenal sufficiently? How much corticoid is necessary for normal resistance to stress?

Other subjects discussed include the histo-chemical changes which occur in the adrenal cortex of fœtal and prepubertal rats, the blood and urinary excretion of various hormones originating in the adrenal cortex, and hermaphroditism.

In the foreword the editor expresses the hope that this volume will prove useful to the pædiatrician, the general practitioner, the endocrinologist and the urologist. In our opinion it is too technical for all except the pædiatrician and the endocrinologist, both of whom should find in it much of interest and use.

Communicable Diseases. By Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P., F.A.A.P., F.A.P.H.A., and collaborators; Third Edition; 1955. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 8½" × 5", pp. 1208, with 124 illustrations, 15 in colour. Price: £9 14s. 3d.

THERE should be no need to apologize for producing a third edition of "Communicable Diseases" by Franklin H. Top. In his preface to the latest edition, the author makes the following statement: "Infectious diseases remain as a threat to mankind and new therapeutic and control weapons have not and are not likely to eradicate the causative organisms. The fundamental principles of management and control of infectious diseases have not altered." The number of collaborators has now increased to 24, and this method of producing a text-book on a subject with such a changing scene seems the only way possible to keep it as up to date as possible. However, it seems strange to see the name of Jonas E. Salk as the author of the chapter on influenza, and to find that in the section on poliomyelitis he does not receive any mention, although some hint is given that momentous events could be expected shortly.

New sections have been introduced on sulphonamides and antibiotics, and another completely new and most interesting chapter is that on viral hepatitis—a broad term, which includes all forms of acute hepatitis caused by hepatotropic filterable infectious agents. A warning is given on the risks of transmission of the hepatitis virus in blood transfusion. Existing information suggests that blood carriers of the virus among the normal population in the United States of America may range between 1% and 5%. In the light of this information, it seems likely that the recent increase of viral hepatitis in Australia may be followed by an increase in serum hepatitis. So far, apparently, no such increase has been reported.

The excellent chapters on nursing have been changed slightly, and these, together with the discussion on medical asepsis and the proper use of gowns, should be studied by all nurses and medical students.

Most of the admirable illustrations have been again reproduced; but one wonders why it should be necessary to demonstrate the now rarely used intubation procedure.

It is pleasing to note, in the section on serum and serum reactions, the continued advocacy of the lateral aspect of the thigh as the best site for intramuscular injections. Also the warning is repeated that caution is necessary in the intravenous administration of serum.

Altogether this text-book contains a mine of information on a wide variety of communicable diseases. The only possible drawback to Australian buyers is the price. Even so, it should have a place in all medical and teaching hospital libraries.

Rehabilitation of a Child's Eyes. By Richard G. Scobee, B.A., M.D., F.A.C.S., revised by Herbert M. Katzin, M.D., F.A.C.S.; Second Edition; 1955. St. Louis: The C. V. Mosby Company. 8¾" × 5½", with illustrations. Price: £1 11s. 6d.

FEW conditions in the field of medicine require greater cooperation between parent and physician and a well-trained technician than does strabismus. "Rehabilitation of a Child's Eyes", by the late Richard Scobee and Herbert Katzin, is written for parents. So much patience is required by the parents at times that an adequate explanation by the oculist in simple language is often needed. If this is not supplied, the parents may feel justified in neglecting the treatment or even in changing the oculist, and this is not always in the best interest of the child. Parental knowledge will lessen more than anything else the unfortunate delay that occurs too often before a child is brought to the specialist. Parents who understand the position explain it to others, and so the early treatment that is so important is more likely to commence for their own and for other children at a suitable time.

In this book there is important information regarding eyes and the art of seeing, but more important is the wisdom expressed in advice to parents. "The best parents are those who understand and observe but say little. No attempt at verbal reassurance succeeds. The hands of the oculist are not infrequently tied by the lack of a child's confidence in his parents." Perhaps it is asking too much of any book to expect it to make these parents anew; but this book should help. It should certainly be in the hands of all oculists and orthoptists, and of not a few parents. The illustrations are original and very helpful.

The Year Book of Drug Therapy (1956-1957 Year Book Series). Edited by Harry Beckman, M.D.; 1957. Chicago: The Year Book Publishers. 7¾" × 5¼", pp. 515, with 69 illustrations. Price: $6.75.

THE 1956-1957 "Year Book of Drug Therapy" comprises abstracts of articles in journals received between August, 1955, and August, 1956. The editor in his introduction refers to the recent heightening of interest in drugs that affect mood and behaviour, and comments that in the period covered, research in this field has assumed "an urgent and most unbecomingly hectic character". He discusses the theories relating to the action in this field of serotonin and lysergic acid diethylamide, and states that they provide "the most important of current pharmacologic topics—although neither of the two agents is actually a drug!". The sections covered by this Year Book are as follows: allergic disorders, cardio-vascular diseases, chest diseases, corticotropin and the cortisones, dermatological maladies, *diabetes mellitus*, gastro-enterological disorders, growth disturbances, hæmatological disorders, hypothyroidism, infectious diseases, kidney disorders, lead and organic phosphate poisoning, liver disorders, neoplastic diseases, neuropsychiatric disorders, obesity, obstetric and gynæcological disorders, pain, rheumatic disorders, surgical disorders, thyrotoxicosis, urolithiasis, worm and fluke infestations. It is evident that the book, as usual, provides a ready source of information on current therapeutic agents employed in every field of medicine.

Rosenau: Preventive Medicine and Public Health. By Kenneth F. Maxcy, M.D., Dr.P.H., with 27 contributing authors; Eighth Edition; 1956. New York: Appleton-Century-Crofts, Incorporated. 10" × 6¾", pp. 1480, with many illustrations. Price:

WITH the appearance of its eighth edition, Rosenau's well-known text-book has changed its title to "Preventive Medicine and Public Health". Kenneth F. Maxcy, Professor Emeritus of Epidemiology at the Johns Hopkins University, is still the editor, and his team of collaborators is substantially the same as for the seventh edition. The size of the work remains unaltered and the treatment is unchanged, except that portions have been rewritten and brought up to date, whilst the index has been made fuller by an increase of roughly 25% in the space allotted to it.

Among changes noted are the recommendations of the 1955 Yellow Fever Conference regarding the use of 17D vaccine, inserted on page 363, and on page 989 *et sequentes*, the standards of maximal permissible exposure to atomic particles and ionizing radiations are brought into line with the recommendations of the National Bureau of Standards publications of 1953 and 1954.

The whole text is an eminently readable account of the field of public health and preventive medicine at the present day. For Australian readers it is to be preferred to some of the English publications on the subject, which tend to devote too much space to a consideration of the administrative set up in force in Britain; this, although of great interest, is not directly applicable to Australian conditions. The multiplicity of State administrations in the United States makes it impossible for a text-book to deal with each in detail. Hence the treatment tends to be on the lines of general principles, which is more useful to Australian readers.

Diseases of the Heart and Circulation. By Paul Wood, O.B.E., M.D., F.R.C.P.; Second Edition, revised and enlarged; 1956. London: Eyre and Spottiswoode. 9¾" × 6¼", pp. 1043, with illustrations. Price: £5 5s.

FOLLOWING three impressions since 1950, Dr. Paul Wood, of London, has rewritten his text "Diseases of Heart and Circulation", very fittingly dedicated to the living father of British cardiology, Sir John Parkinson, to whose example and precept Dr. Wood and many senior cardiologists of this country owe so much. Sir John would also agree with Dr. Wood's observation that "there is plenty of evidence to show that we are in danger of losing our clinical heritage, and of pinning too much faith in figures thrown up by machines". In this edition, the author has consistently emphasized the detail and value of precise clinical observation, and has kept a proper balance in his description of diagnosis between the information available at the bedside and from the laboratory.

Reviewing progress in cardiology between this edition and the last, Dr. Wood indicates cardiac surgery as the most rapidly developing component. He believes that hypothermia is still slightly ahead of the artificial circulation as its handmaid, and that the techniques of vectorcardiography, ballistocardiography and electrokymography have added least to knowledge in the last five years.

The second edition has much the same format as the first, commencing with a description of symptoms and signs of heart disease, followed by electrocardiography, special investigations, radiology, heart failure, and then complete chapters on all the chief ætiological types of cardiopathy. This includes a section of 162 pages on congenital heart disease, representing a virtual text-book itself in this field, to the knowledge of which the author has contributed importantly. The chapter on hypertensive heart disease has been enlarged, particularly in relation to treatment, and presents a full discussion of current trends in drug therapy. Aortic stenosis also is another subject now receiving intensive study, and clear indications for diagnosis and management are provided. We commend the cautious approach to aortic valvotomy. A concise summary of the role of lipoids in atherosclerotic disease is succeeded by an excellent chapter on ischæmic heart disease. Wood describes the Eisenmenger syndrome as a common hæmodynamic complex occurring in patent ductus, ventricular septal defect and atrial septal defect, all with pulmonary hypertension, whereas the term "Eisenmenger complex" retains its classical character. The concluding chapters on unusual forms of heart disease, non-rheumatic myocarditis, hyperkinetic circulatory states, pulmonary hypertension, and the heart in thyroid disease are most useful and clear.

In a work so detailed, so precise, and so dogmatic, it is not difficult to find isolated statements which are open to criticism. These range from obvious typographical errors, such as that mitral stenosis occurs four times more commonly in males, to the dismissal of intercurrent respiratory infections as important starting points of heart failure in chronic rheumatic heart disease. Dr. Wood defines clearly the respective duties of physician and surgeon in surgical heart disease, a situation which has become a little blurred. The Taussig-Bing complex is not mentioned, nor is there any reference to the value of salt restriction and mercurial

diuretics in constrictive pericarditis before and after operation. In the section on beriberi heart, the permanent damage which often remains in spite of prompt and adequate doses of vitamin B_1 is not discussed. The differential diagnosis of chest pain is not fully explored. Something more on the dietetics of coronary artery disease could be given and no doubt will be included in the next edition.

Dr. Wood understands his subject so thoroughly that it is most difficult to differ from him, and he has every right to be dogmatic and to displace accepted theories or traditional points of view in the fields in which he can call on his own experience and records to justify his criticism. His thrift of words, his thoroughness, his equal familiarity with both clinical and investigative detail, have produced again a factual, succinct and topical text-book, which will be as eagerly received and digested as the last. It is in general too detailed for student use, and general practitioners will read certain chapters only, preferring to keep it for reference. The cardiological world accepted the first edition as an indispensable guide to the modern British outlook and practice in this specialty. The illustrations are uniformly excellent, the references are complete, the reproductions of electrocardiograms, pressure tracings and angiocardiograms are of the highest quality and well balanced with the textual matter. There are no pictures of pathological specimens, and very few phonocardiograms. The form, printing and paper of the book are a stimulus to congratulate the publishers. Wood's "Diseases of Heart and Circulation" is a "must" for every practising physician, every laboratory and every library. Never was so much said in so few words to so many interested readers.

Functions of Autonomic Transmitters. By J. Harold Burn, M.D.; The Abraham Flexner Lectures Series Number Thirteen; 1956. Baltimore: The Williams and Wilkins Company (published for Vanderbilt University). Sydney: Angus and Robertson, Limited. 8½" × 5½", pp. 238, with illustrations of figures and tables. Price: 55s.

IN 1956, Professor J. H. Burn delivered the Abraham Flexner Lectures of Vanderbilt University. Since research in the Department of Pharmacology at Oxford has for many years been centred upon problems of neuro-humoral control, it is natural that this should form the topic of these lectures. However, there are two, the first and last, dealing with wider topics—"Medical Education and Medical Science", and "Our National Drugs—Alcohol and Nicotine".

The remaining five chapters deal with the autonomic transmitters, and with acetylcholine and its role in cardiac contractility, and the actions of nor-adrenaline are discussed in Burn's characteristically lucid style, with particular reference to the Oxford research.

There is an intriguing chapter on ciliary movement and the influence of drugs thereon, which is a model of painstaking and careful research, and should provide a great stimulus to those embarking on any research project. The change in sensitivity of structures under autonomic control consequent upon denervation forms another interesting topic, and the study of multiple actions in such drugs as the local anæsthetics, anti-fibrillatory drugs and spasmolytic agents completes the book.

Each chapter is followed by a valuable selection of references, and the book is excellently produced. This book should be snapped up by students and research workers in physiology and pharmacology; but apart from these it should interest many who are anxious to keep abreast of modern research, and whose associations with these subjects date from recent years.

Children's Eye Problems. By Emanual Krimsky, M.D.; 1956. New York and London: Grune and Stratton, Incorporated. 10" × 7", pp. 187, with many illustrations. Price: $6.00.

ALTHOUGH this book claims "to provide the psediatrician and the general practitioner with a practical, usable guide to the understanding of children's eye problems, and at the same time to present to the ophthalmologist a plan for dealing with the child as a whole", we consider that it can be recommended only for one who has an adequate ophthalmological background. At times the author's statements are too brief to be clear to the unknowledgeable, as, for example on page 31, where 15 causes of unequal pupils are given; it is not revealed which cause dilatation of the pupils and which cause contraction.

The suggestion that penicillin be given systemically rather than locally for "pink eye" because of the danger of producing sensitivity would not meet with support in Australian practice. The use of cortisone is recommended rather freely, although Thygeson's warning that it is contra-indicated in herpetic infections is noted.

The treatment of chemical burns is dealt with too scantily; the dreaded lime burn is not even mentioned.

The author's condemnation of occlusion for amblyopia makes it appear that he has never seen an occlusion clinic such as is attached to orthoptic clinics of the ophthalmic departments of British and Australian hospitals. Apparently he has never enjoyed the assistance of an orthoptist. As for strabismus, it almost seems that nineteenth century treatment is being dispensed in Krimsky's clinic. The methods of T. K. Lyle do not yet appear to have penetrated there. The references are mainly to American publications, although Australia is not neglected, both Sir Norman Gregg and J. B. Hamilton receiving a mention. We cannot help feeling that a little more time spent by the author in perusing modern British literature would not go amiss.

The final section of the book, "Problems and Management", will repay a glance; it is probably the best section of the book.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Lumbar Puncture and Spinal Analgesia", by Sir Robert Macintosh, M.A., D.M., F.R.C.S. (Edin.), F.F.A.R.C.S., M.D. (hon. causa), Buenos Aires and Aix-Marseilles, Hon. F.F.A.R.A.C.S.; Second Edition; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 8½" × 5½", pp. 152, with 111 illustrations. Price: 25s.

The book has been generally but not radically revised.

"Symptoms and Signs in Clinical Medicine: An Introduction to Medical Diagnosis", by E. Noble Chamberlain, M.D., M.Sc., F.R.C.P.; Sixth Edition; 1957. Bristol: John Wright and Sons, Limited. 8½" × 5½", pp. 520, with 374 illustrations. Price: 35s.

This book has been extensively revised since the previous edition of 1952.

"Modern Clinical Psychiatry", by Arthur P. Noyes, M.D.; Fourth Edition; 1956. Philadelphia and London: W. B. Saunders Company. 9¼" × 6", pp. 630.

This book has been revised and expanded since the previous edition of 1948.

"Antibiotics Annual, 1956-1957: Proceedings of the Fourth Annual Symposium on Antibiotics"; edited by Henry Welch, Ph.D., and Félix Martí-Ibáñez, M.D.; 1957. New York: Medical Encyclopedia, Inc. 10" × 6¾", pp. 1152, with many figures. Price: $10.00.

The proceedings of a symposium held in October, 1956.

"A Radiologic Study of the Brain Circulation by Rapid Serial Angiography of the Carotid Artery", by Torgny Greitz; 1956. Stockholm: Acta Radiologica (Supplement 140). 9¾" × 7", pp. 124, with 28 illustrations. Price: Sw. Kr. 30.

The title is self-explanatory.

"The Neurologic and Psychiatric Aspects of the Disorders of Aging: Proceedings of the Association for Research in Nervous and Mental Disease, December 9 and 10, 1955", edited by Joseph Earle Moore, M.D., H. Houston Merritt, M.D., and Rollo J. Masselink, M.D.; Volume XXXV, 1956. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 6", pp. 320, with 79 illustrations and 17 tables. Price: £4 13s. 6d.

The title is self-explanatory.

"Psychology, Religion and Human Need: A Guide for Ministers, Doctors, Teachers and Social Workers", by W. L. Carrington, M.D.; 1957. London: The Epworth Press. Melbourne: William Heinemann (Medical Books), Limited. 8½" × 5½", pp. 330. Price: 37s. 3d.

The contribution of a practising Australian psychiatrist to the understanding of pastoral work.

The Medical Journal of Australia

SATURDAY, JUNE 8, 1957.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

WILLIAM HARVEY: 1578–1657.

WILLIAM HARVEY was born at Folkestone on April 1, 1578. Fortunately his father was a man of some substance and able to give his son a liberal education. After passing through the Grammar School at Canterbury he entered the University of Cambridge on May 31, 1593, and took his Bachelor of Arts degree in 1597. The main contribution of Cambridge was a good grounding in Latin, which enabled him to read widely and to write in that classic language, then the *lingua franca* of the learned, with ease and flexibility. Far more important than Cambridge was his choice of study in Padua, to which city he travelled shortly after leaving Cambridge. The University of Padua was founded in 1238 by Frederick II of Hohenstaufen, whom many historians regard as the most intellectual of all monarchs. This university soon acquired a high renown in the world of learning and art and was a pioneer in the science of the Renaissance, so much so that a legendary notoriety connected the University of Padua with the forbidden study of magic. It will be remembered that the father of the "Ladye of Branksome" in the *Lay of the Last Minstrel* had studied black art in "Padua far beyond the sea". Walter Scott, in one of his learned notes, wrote that "Padua was long supposed by the Scottish peasants to be the principal school of necromancy". Be that as it may, the University Medical School built in 1594 the first anatomical theatre in the world—it still exists—and the fame of this school must have reached England and excited the ambition of the young Harvey, who had chosen the profession of medicine. So we may picture the famous anatomist Fabricius demonstrating his dissections to an audience of students which included a young Englishman in his twenties.

A matter concerning Harvey's studies in Padua has not been given the emphasis it deserves. The great Galileo was professor of mathematics there from 1592 to 1610, and Harvey could not have missed hearing about the defeat of the Aristotelians at Pisa, which aroused such hostility towards Galileo that he resigned his chair at Pisa and went to Padua via Florence. Harvey's statement that he gained his ideas from dissection and experiment "and not from the writings of others" has a decided Galileo touch. It was in the steep little theatre of Padua that Fabricius demonstrated the valves in veins and ascribed to them the function of acting as brakes in the ebb and flow of blood. The mechanical mind of the youthful Harvey was not satisfied with this explanation, and there commenced that train of thought, backed up by well-designed experiments, which culminated in his belief in the circulation of the blood as we know it today, with the one small exception that, lacking a microscope, he could not see the capillaries and so assumed that the veins collected from lungs and body tissues the blood which had been absorbed as by a sponge. Harvey returned to England in 1603 after obtaining his doctorate of medicine. There is evidence that he began expounding his views on the circulation in 1616, the year of Shakespeare's death, but it was not until 1628 that the great masterpiece *De Motu Cordis* was published. That some opposition should have developed was natural, but it has been grossly exaggerated. The gossip of Aubrey cannot be accepted in its entirety. Doubtless some falling off in his medical practice took place, but enough remained to make him a man of comparative wealth. It is pleasant to record that Harvey during his life received the highest honours in his profession, was welcomed at courts and became the friend of princes. He died on June 3, 1657, and a world-wide tercentenary commemoration of his death is being held this year.

To understand the immensity of the revolution Harvey effected one has only to examine the physiology of blood circulation before and after his book was published. It is true that Servetus, arguing from occult premisses, described the pulmonary circulation, but this had little acceptance. Harvey had to disprove one established doctrine after another, and he did so with convincing experiments and clear exposition. It was believed that the heart was not muscular; that the pulse arose when arteries dilated, and blood or air or both was sucked into the cavities thus made; that the septum of the heart contained pores through which right and left ventricles communicated. Vesalius could not see these pores, but he could not deny their existence. Leonardo da Vinci strongly supported the Galenical conception of pores in the septum. The only circulation of the blood was an ebbing to and fro like the tides, and the dynamic organ was the liver. Each of these misconceptions had to be separately examined, attacked and demolished. One consequence of the greatness of Harvey's achievement can be found in the attempts in recent times to give the priority to other and mostly Italian medical writers. To these claims we can apply the words of P. H. Pye-Smith in his excellent biographical notice of Harvey, "a proof of the blindness of misplaced national vanity".

Harvey actually spent more years of study and experiment on generation than on circulation, just as Newton made laborious investigations on practical chemistry, and for a longer period than he devoted to mathematics, astronomy and physics. The fact that Harvey had no microscope prevented him from making any major discovery in this biological field, but his work is still worth reading, and this cannot be said of Newton's chemistry.

Harvey had no immediate successor. Thomas Sydenham (1624-1689) was a clinician and not a physiological experimenter. It is not in the least derogatory to Sydenham's fame to state that, great as was his achievement, it cannot be regarded as so outstanding as Harvey's. Appreciation of Sydenham as introducing a new epoch in medical ætiology, in diagnosis and in some degree in treatment is mostly to be found in the ranks of the medical profession, whereas the greatness of Harvey, like that of Newton and Darwin, is recognized and extolled by all thinking men in every profession and in all countries.

Current Comment.

SOME PIONEERS OF CARDIOLOGY.

AT this time of the tercentenary of the death of William Harvey, it is fitting that we should give some thought, not only to the historical importance of his discovery of the circulation of the blood, but also to its impact on medical study and practice. It is, of course, stating the obvious to point out that the field of its greatest importance is that of cardiology. Morris C. Leikind[1] presented what he describes as an outline sketch of the history of cardiology at the Post-Graduate Seminar on Diseases of the Heart, sponsored by the Armed Forces Institute of Pathology and the American Heart Association, Incorporated, and held on May 14 to 17, 1956. This is particularly interesting at the present time, because he mentions some of those who preceded Harvey, and whose observations Harvey used. Here let it be said that Harvey always acknowledged his indebtedness to those whose work had helped him to make his great discovery. It will not be out of place if we also consider them. Leikind states that cardiology began when man first became aware of his heart. This goes back to prehistoric times; some drawings of the heart are at least 20,000 years old. References to the heart and pulse are found in some of the earliest medical texts. That the early Egyptians considered the heart a vital organ is shown by the fact that during mummification the heart was left in the body, while the brain was destroyed; yet it is clear that the ancient Egyptians had no understanding of the circulation. It was the Greeks, centuries later, and especially those associated with Hippocrates, who took the first steps towards separating medicine from magic. Hippocrates and Aristotle both regarded the heart as the most important organ of the body, the centre of life and the seat of the intelligence. The Greeks looked on the heart as an organ of bodily heat, and on the brain as an organ for cooling the blood. Hippocrates thought that the heart was immune to disease, and this misconception was not properly dispelled until men began to think in anatomical and physiological terms, centuries later. About 300 B.C. the Greek centre of medical study moved to Alexandria. There Herophilus, an anatomist, showed that the brain and not the heart was the seat of the intelligence, and distinguished between arteries and veins. Erasistratus almost discovered the circulation; he regarded the heart as a pump, and examined its valves and the *chordæ tendinæ*; but, like Herophilus, he believed that arteries carried air and veins blood. Four hundred years were to elapse before Galen showed that the arteries contained blood and not air. Galen's further doctrines relating to the heart appear ridiculous to us now; but they were the best that could be done with the knowledge available at the time, and they persisted for centuries. In the fifteenth and sixteenth centuries, men like Leonardo da Vinci, Vesalius and many others began to work from observation, and to describe what they saw, and not what Galen and the ancients told them to see. Leonardo da Vinci made attempts to explain the movement of the heart by observing the motions of long needles inserted into the beating heart of a pig through the chest wall, and he was also the first to describe the moderator bands of the heart. However, it was Vesalius who took the first steps towards solving the riddle of the circulation. Leonardo's work was not published until long after his death; but Vesalius had the advantage of the printing press. His work on the structure of the human body was published in 1543, and he corrected many of Galen's errors. Possibly the most important of these was the doctrine evolved by Galen that there were invisible pores in the interventricular septum, and that the blood passed through them from the right to the left ventricle. Vesalius in his second edition stated categorically that he could see no pores, and could not explain how the blood passed from one side of the heart to the other. In the thirteenth century an Arab scholar, Ibn-an-Nafis, had clearly described the lesser or pulmonary circulation. We have no evidence that Vesalius or any of his followers knew of this work. In Spain, Michael Servetus, a theologian, in 1553 independently described the lesser circulation, and two years later Realdo Colombo, who taught at Padua after Vesalius, also described it. In the anatomical theatre where Vesalius had performed his dissections worked Fabricius ab Aquapendente, who published a classical work on the valves in the veins. It was at this point that William Harvey fitted together almost all the pieces of the puzzle of the circulation, and showed that the blood moved in a circle propelled by the muscular force of the heart. (This event, which took place in 1628, Leikind considers to be the most important in the history of cardiology.) However, there was still one piece missing—the manner of passage of blood from arteries to veins. For Harvey, capillaries were a logical necessity. A new instrument of research, the microscope, was introduced, and Marcello Malpighi and Antony Van Leeuwenhoek, by its use, demonstrated their existence. The puzzle was solved.

The stage was now set for cardiology to emerge as a science. In 1733 Stephen Hales, an Anglican curate, experimentally measured the blood pressure of the horse, and opened up hæmodynamics as a branch of cardiology. He calculated the velocity of the blood flow in the aorta, and showed that the pulse rate was faster in small than in large animals. No particular further advance was made in this field of cardiology until 1847, when Carl Ludwig introduced the mercury manometer. However, Harvey's discovery had provided the basis for explaining the mystery of respiration. Advances in this field came rapidly; many were made by contemporaries of Harvey, among whom were Robert Boyle and Richard Lower. Lower showed that fresh blood clots turned bright red when exposed to air. Boyle was the first to study blood gases, and also to note air embolism and its mechanical effects. Boyle's assistant, Robert Hooke, demonstrated that the important thing in respiration was the passage of air into and out of the lungs, and not the motion of the lungs *per se*. About twenty-five years later, the suggestion was made by John Mayow that a special part of the air was the essential element in respiration. This led to the discovery of oxygen by Scheele and Priestley.

Here another phase of cardiology comes into prominence—that of diseases of the heart and circulation. In 1707, Lancisi, of Rome, at the request of Pope Innocent XII, wrote a treatise on sudden death, in which he attempted to classify heart disease. Raymond Vieussens, of Montpellier, in 1715 wrote a treatise on the subject, in which he described pericarditis, mitral stenosis and aortic regurgitation. Senac, in 1749, in France, wrote a book on the heart, its action and diseases; well into the nine-

[1] *Mil. Med.*, April, 1957.

teenth century, this was regarded as a standard work. Senac was one of the first to use quinine in the treatment of heart disease. By the publication in 1761 of Morgagni's classical work on seats and causes of disease, pathology acquired an anatomical basis. Morgagni recorded, in the form of letters to a friend, a vast number of observations on the lives and deaths of his patients, with autopsy findings. He was the first to stress the importance of physical signs in the diagnosis of diseases of the chest. This was the year in which Auenbrugger published his work on percussion—a book which was almost forgotten until Corvisart, Napoleon's physician, translated it into French in 1808. Corvisart, it will be remembered, was the teacher of Laennec, who invented the stethoscope. This brings us to the opening of the nineteenth century, and great advances had been made. The theory of circulation was now fact, respiration was beginning to be understood, metabolism was slightly less shrouded in mystery than before, and many disease phenomena had been recognized. The previously existing hopeless attitude towards heart disease was beginning to be dispelled; hope was increased when in 1785 William Withering introduced digitalis into cardiology, and it was thought that other drugs might be found helpful as well. At about the same time William Heberden published his descriptions of *angina pectoris*, although he did not know its cause. More attention was focused on angina as a result of the sudden death of John Hunter from it. Hunter himself, at a post-mortem examination on a subject dead of the disease, had found a calcified coronary artery. Edward Jenner and Caleb Perry, his students, were the pioneers of this theory of its origin; they had already noted the condition, but withheld publication of their work because they knew that Hunter was suffering from angina. The true importance of the coronary arteries in relation to heart disease was not recognized until the twentieth century. The recognition was largely due to the work of James Herrick, of Chicago. About 1812, William Charles Wells drew attention to the connexion between rheumatism and heart disease. Here Laennec with his stethoscope comes into the picture. His famous treatise on mediate auscultation was published in 1819. Increased attention to the pulse as an aid to diagnosis by such men as Stokes, Adams, Cheyne and Corrigan brought about a further advance, and another step was taken when in 1867 Pierre Potain promoted the sphygmograph from the laboratory to the clinic. By further developing Potain's technique, Sir James Mackenzie placed the clinical study of heart disease on a more scientific basis. The birth of bacteriology late in the nineteenth century initiated a new stage. It became possible to make an accurate diagnosis in such conditions as infective endocarditis. Almost at the same time, two more important diagnostic aids were introduced—the X rays, discovered by Röntgen in 1895, and the string galvanometer, developed by Einthoven in 1903. The latter was the foundation of the electrocardiograph, and here we enter upon the modern period of cardiology.

In this brief outline, as Leikind himself states, much has had to be left out. However, it does give some idea of how advances were made, and of who made them. Leikind closes his account on a slightly prophetic note. He points out that, as we probe more and more deeply into the study of various heart disorders, we find that more and more they involve a biochemical approach. Thus the present may be designated the biochemical phase of cardiological research.

JOSEPH BLACK AND THE DISCOVERY OF CARBON DIOXIDE.

THERE is nothing new in the observation that important scientific advances are often simply by-products of work done to elucidate some totally different problem. An excellent example of this phenomenon is provided by Joseph Black's discovery of carbon dioxide, or, as he called it, "fixed air". Black was born in 1728 at Bordeaux, where his father, a native of Belfast of Scottish descent, was engaged in the wine trade. He was educated at Belfast, and then proceeded to the University of Glasgow, where he matriculated in 1746, and began to study languages, philosophy, chemistry and medicine. About 1751 he transferred to the University of Edinburgh, to complete his medical studies. In 1754 he presented his thesis for the degree of doctor of medicine; it was entitled *"De humore acido a cibis orto, et magnesia alba"*. In this thesis he described his investigations in causticization, and anticipated the work of Lavoisier by recording the existence of a gas, not common air, which he had discovered by the use of the balance. Richard Foregger[1] tells the story of this interesting piece of scientific detective work; we cannot give all the details here, but the following quotation from a letter written by Black to Cullen may serve as an inducement to the reading of the whole of Foregger's article:

> I fully intended to have wrote last post, but really I happened to be intent upon something else at the proper time, and forgot it. It was, indeed, an experiment I was trying that amused me, in which I had mixed some chalk and vitriolic acid at the bottom of a large cylindrical glass; the strong effervescence produced an air or vapour, which, flowing out at the top of the glass, extinguished a candle that stood close to it; and a piece of burning paper, immersed in it, was put out as effectually as if it had been dipped in water; yet the smell of it was not disagreeable.

Foregger remarks that Guerlac has pointed out that this is the earliest mention of Black's experimental work which resulted in the identification of carbon dioxide as a particular gas. In 1756 Black was appointed professor of anatomy and lecturer in chemistry (the latter in succession to William Cullen) in the University of Glasgow. It is also recorded that he gladly exchanged the chair of anatomy for that of medicine, and he also engaged in active medical practice. In 1766 he returned to Edinburgh, to become professor of chemistry (once more in succession to William Cullen). He died in that city on December 6, 1799.

Black did a great deal of experimental work on the production and properties of "fixed air"; one of his experiments on its production in respiration is described as follows by Professor John Robison, who edited and published Black's "Lectures on the Elements of Chemistry" after his death:

> In the winter of 1764-5, Dr. Black rendered a considerable quantity of caustic fossil alkali [NaOH] mild and crystalline, by causing it to filtre slowly by rags in an apparatus which was placed above one of the spiracles in the ceiling of a church, in which a congregation of more than 1500 persons had continued near ten hours.

Foregger points out that Black was living in Glasgow during the winter of 1764-1765, and at that time the College residents attended the Blackfriars Kirk; it is possible that that was the scene of the experiment. It was Black who introduced the doctrine of latent heat, which he taught in his lectures from 1761 onwards. In April, 1762, he described his work to a literary society in Glasgow; but he never published any detailed account of it. It was also Black who founded the doctrine of specific heats, and showed that equal additions or abstractions of heat produced equal variations of bulk in the liquid of his thermometers. However, we are concerned chiefly with his work on carbon dioxide, and Foregger summarizes it in the following terms. Black identified carbon dioxide as a specific gas with certain properties which differed from those of common air. He observed its effects on animals, determined its production by respiration and fermentation and by the burning of charcoal, and inferred its presence in the atmosphere in small amounts. He found that it behaved as an acid and was absorbed by slaked lime and the caustic alkalis to form carbonates. During his research work on lime, by the use of quantitative methods he showed that the causticization process was due to the

[1] *Anesthesiology*, March-April, 1957.

transfer of carbon dioxide from alkali carbonates to calcium hydroxide, which resulted in the formation of alkali hydroxide and calcium carbonate. He used the lime-water test to determine the presence of carbon dioxide, and as part of his experimental work he precipitated lime-water by breathing through it. This is the test which is still in use for the presence of carbon dioxide. Foregger points out that the researches of Joseph Black are the foundation of methods used at the present time for the absorption of carbon dioxide in anæsthetic practice, in the testing of metabolism, in mine rescue work, and in underwater and high-altitude operations. And all this was initiated by what Black described as "an experiment I was trying that amused me".

A NEW APPROACH TO EMBRYOLOGY.

IT is probable that the first thought of most medical men, as they turn the pages of a new, long, excellent and important book on embryology by C. H. Waddington,[1] will be: "What on earth has happened? This is not the embryology which I studied as a student!" And indeed it is not. Diligent search will find reference to some matters which it is held important, in most medical schools, that the medical student should know; but much is absent altogether, and the bulk of the book is devoted to the discussion of problems of whose existence only rare and exceptionally thoughtful students would be aware. Embryology at one time found its more general interest in the help it gave in the problems of animal classification and to the elucidation of evolutionary relationships, and in the theory of recapitulation, now to all intents and purposes abandoned. The fact is that embryology has changed radically, and this book, unlike some others with similar titles, is abreast of the change. There was, of course, even in the last century, an attack by a small group of distinguished workers on the problem, that of the physiological mechanism by which, from a unicellular egg showing so little structure, the immense complexity of a man or an animal could be produced. It was evident that experiment alone could begin the penetration of this mystery, and many ingenious experiments were performed; but it was only in 1921 that the great German embryologist, Spemann, performed the experiments which led to the impressive developments of the present century. It is since this time that the balance of embryology has shifted from the comparative study of morphological changes to the experimental attack on the processes underlying them. The present work deals almost wholly with the results of these experimental studies. It is possible to make a criticism of the title of the book. It cannot be denied that the book deals with principles of embryology; but it deals only with those studied in the experimental phase of the subject, whose services to the study of classification and phylogeny receive only the briefest discussion, while the concept of homology, so basic to all comparative morphological studies, and so much in need of study in the light of modern genetics, is not even mentioned. Indeed, almost the whole field of comparative embryology is left aside, except in so far as, in certain areas such as gastrulation movements, the newer experimental methods have been more successful than the older observational methods.

The book is in two parts. The first part is entitled "The Facts of Development", and deals with genetics, fertilization and cleavage and then with particular groups, concentrating on vertebrates, echinoderms and insects, the three major groups in which most experimental work has been done. This part closes with two chapters on growth and regeneration respectively; both these chapters, and especially that on regeneration, might with advantage have been longer. The difficult but fascinating second part of the book deals with "The Fundamental Mechanism of Development". It opens with chapters which leave no doubt that embryology and genetics, two sciences of such disparate origins, can no longer be regarded as separate disciplines, now that the embryologist, pushing his analyses ever further back into earlier developmental stages, begins at last to arrive at the gene, or very close to it. It becomes clear, too, that it is not only between embryology and genetics that the division is breaking down; genes lead to plasmagenes and viruses, to a discussion of the relation of these enigmatic bodies to developmental processes, to the synthesis of proteins, and so to yet another major field, that of biochemistry, whose impact on embryology is perhaps today mainly in the field of desoxyribonucleic acid and ribonucleic acid.

The book presents much the most successful picture which has yet appeared of mid-century embryology, for it is in the subjects with which it deals that the embryologists of the day are interested. When we remember the large share which Waddington has played in the developments his book describes, its accuracy is hardly to be challenged, and the detail is given as fully as can reasonably be expected in a book whose text ends at page 468. There are many illustrations; most of them are adequate, though some could be more fully or more clearly explained. The text is generally clear; but this is a difficult subject, and many passages, especially in the second part, deal with matters which are still only just coming under investigation, so that it should not be expected that the reading will always be easy. The book will have a very important influence on the further development of embryology, and will be the standard text for many years; it is to be hoped that later editions, or perhaps shorter supplementary volumes, will appear not too infrequently.

[1] "Principles of Embryology", by C. H. Waddington, Sc.D., F.R.S.; 1956. London: George Allen and Unwin, Limited. 9½" × 6", pp. 520, with many illustrations. Price: £2 5s.

METABOLIC STIMULATION BY SALICYLATE.

THERE has been much discussion about the mode of action of salicylate in rheumatic fever and in the relief of pain, but no satisfactory explanation can as yet be given. It has been known for some time that, with full doses of the drug, there is a progressive rise in the output of nitrogen in the urine, which exceeds the protein intake, and at the same time respiratory alkalosis develops. These changes reach their height between the sixth and tenth days of salicylate administration when the temperature has returned to normal. The relation between the increased protein metabolism and the alkalosis has not been clear. During an attempt to elucidate this problem, J. Reid[1] has noticed that a considerable increase in oxygen consumption and carbon dioxide production follows injection of sodium salicylate into rabbits. The salicylate is obviously acting as a powerful metabolic stimulant. Reid also reports a close relation between the serum salicylate level and oxygen consumption. The increase of carbon dioxide production does not quite keep pace with the oxygen consumption. A comparison of salicylate and 2:4-dinitrophenol shows that salicylate is just as effective a metabolic stimulant as 2:4-dinitrophenol, though a much larger dose is required. With a large dose of salicylate an animal may die with hyperthermia from excessive metabolic stimulation.

It has been variously claimed that salicylate directly stimulates the respiratory centre or the vagus nerve endings. Such explanations are unnecessary now that the metabolism-stimulating effect is known, and with it increased ventilation to meet the greater oxygen requirement, associated with a relative diminution in carbon dioxide production. This is in keeping with the finding of increased protein katabolism, and respiratory alkalosis results. This kind of respiratory alkalosis is a new clinical entity.

How these findings affect the therapeutic application of salicylates is not clear. In the past it has been believed

[1] *Scot. Med. J.*, March, 1957.

that salicylate relieves symptoms through an action only on higher nervous centres and not on the disease process. An interesting point arising from the discovery is a possible danger in the therapeutic use of the drug as well as the apparent paradox of a metabolic stimulant being also an antipyretic. Salicylate stimulates the sweating mechanism and this leads to the antipyresis. If for any reason, such as serious dehydration or electrolyte depletion, the sweating mechanism fails, hyperpyrexia may result from the increased metabolic activity. The drug is often given in near toxic doses for full therapeutic effect, and the acute rheumatic syndrome known as cerebral rheumatism merits closer examination. The clinical symptoms which have been noted resemble closely those associated with salicylate overdosage, and the patients die with hyperthermia. Reid suggests that cerebral rheumatism with death in hyperpyrexia "is synonymous with salicylate overdosage in a rheumatic patient who, because of dehydration and electrolyte depletion or for any other reason, is incapable of sweating". How the increased metabolism can affect the progress of the rheumatic condition is not suggested, and obviously much work remains to be done, but at least the finding gives more hope for understanding the current views.

MEPROBAMATE ADDICTION.

THERE was a time when therapeutics had a certain mysticism, and then a period when every drug was regarded with what was, perhaps, undue caution. In our thyrotoxic and blasé present we are assailed from all sides with drugs which are bigger, better, brighter, cheaper, dearer, more elegant, plainer, safer, more drastic, or free from side effects. Ataraxics and depressants have been in the van with their lack of reticence. However, R. M. Philips, F. R. Judy and H. E. Judy[1] have recently reported two cases of addiction to meprobamate. Previous reports have been scanty with regard to addiction, and it may be wondered whether the honeymoon of meprobamate with freedom from addiction is ending.

The first patient of Philips *et alii* suffered withdrawal symptoms when administration of meprobamate was stopped in the hospital to which she had been admitted with a hæmatemesis. The administration of meprobamate had begun because of the patient's "vasomotor and psychosomatic symptoms", and a dosage of about 400 milligrammes four times a day had been given intermittently for one year. Her withdrawal symptoms were those of a violent, agitated, *delirium tremens*. Eventually the domestic history of this addiction was discovered. The patient had used housekeeping money to obtain meprobamate, had lied about it, and had hidden bottles of it about the house. She had been taking fourteen tablets per day.

The second patient did not have such a straightforward history, as she was also diabetic and neurotic, but upon withdrawal of her dosage of eight tablets per day she became agitated and deluded for the first time in her life. On withdrawal of meprobamate, and after the stormy withdrawal period, the patient returned to her previous state of good health.

TEMPORAL ARTERITIS.

TEMPORAL ARTERITIS is one of those conditions which we usually regard as rather odd and a trifle worrying, but nothing more. Every now and then, however, we are arrested abruptly by the complaints of someone who claims to be incapacitated by the disease. At first sight it seems more than normally bizarre that two irritable arteries should be so troublesome; but there can now be no doubt that temporal arteritis may be so insistent as to make a person suicidal. The parallel in effect with causalgia is quite close. The name is not entirely satisfactory, since the cranial arteries may be involved instead, and in fact identical lesions have been recorded in the aorta and most of the visceral and peripheral arteries.

The earlier reports of this condition stressed the benignity of it, but this unfortunately is by no means true. The visual tracts are not infrequently involved, and this may lead to permanent blindness. There have been reports of death from temporal arteritis. These reports must be received with due scepticism, since the age group in which temporal arteritis occurs is the one next to death anyway; still, there is a strong probability that the disease will cause death.

Treatment in the early days consisted merely of supportive therapy and anodynes, in the expectation of self-limitation of the disease. This occurred in a gratifying number of patients as far as the physician was concerned, although the patients would not have been quite so pleased with the uncomfortable wait. This phase of treatment was followed by section of the affected artery and removal of a part of it. This operation arose from the observation that biopsy would quite often remove the head pain. Although section and removal prove remarkably successful, there remain a few patients who continue with malaise, fever, head pain and emaciation. Inevitably corticosteroids were tried in the treatment of the disease, and temporal arteritis has proved to be one of the conditions for which cortisone is particularly suited, as shown by N. C. Birkhead *et alii*.[1] Within a few days patients become asymptomatic and regain a feeling of well-being. There is, however, a critical level of corticosteroid below which symptoms will reappear, thus demonstrating the suppressive and not curative action of the agent. The involvement of ocular tissue may possibly be arrested, but certainly no improvement occurs.

[1] *North West Med.*, April, 1957.

DUMB-BELL TUMOURS OF THE PAROTID GLAND.

MOST tumours of the parotid gland are superficial to the facial nerve, since most of the gland is itself superficial. Of the rare parotid tumours arising deep to the facial nerve the rarest are those with a retropharyngeal extension. D. G. Patey and A. C. Thackray[2] report on four cases of parotid tumour with retropharyngeal extension; this, as they remark, constitutes a large personal experience. The normal parotid gland has a small pharyngeal projection, but this is of little consequence, although there is considerable disagreement on whether or not the small projection is in fact a protrusion through a deficient parotid gland capsule. From the point of view both of pathological anatomy and of the surgical approach, retropharyngeal parotid tumours are extensions of a tumour arising in the deep portion of the gland, but superficial to the stylo-mandibular tunnel, and extending into the retropharyngeal region. Patey and Thackray regard the opening of the stylo-mandibular tunnel as bordered by the mandible, the styloid process and the stylo-mandibular ligament.

The patient may present with an external swelling, a pharyngeal swelling, or both. A bimanual examination with one hand in the mouth will usually discover the retropharyngeal portion of the tumour, and *ballottement* will usually reveal the dumb-bell nature of the parotid tumour. The neck of the dumb-bell is, of course, at the opening of the stylo-mandibular tunnel. The parotid tumour may be of any type, and the only effective treatment is surgical removal. The operation of choice is parotidectomy. The retropharyngeal extension of the tumour is easily delivered after division of the stylo-mandibular ligament and fracture of the styloid process have been carried out.

[1] *J.A.M.A.*, March 9, 1957.

[2] *Brit. J. Surg.*, January, 1957.

Abstracts from Medical Literature.

PÆDIATRICS.

Cystic Fibrosis of the Pancreas with Pancreatic Insufficiency.

H. SHWACHMAN *et alii* (*Am. J. Dis. Child.*, October, 1956) present the results of a long-term study which indicates that varying degrees of pancreatic involvement occur in patients with cystic fibrosis. Of these patients four died, and the autopsy reports on these are included. Also, 14 other patients were included in the study, and of these six have been followed sufficiently long by repeated duodenal fluid assays to see progress from a state of partial to one of complete pancreatic enzyme deficiency. Dissociation of enzyme activity of the duodenal aspirate is frequently noted in these patients. In 17 cases the diagnosis of cystic fibrosis was made before complete enzyme deficiency occurred. The features which led to this diagnosis in patients who had only the pulmonary features of cystic fibrosis were a positive family history, the abnormally increased viscosity of duodenal fluid, scant flow, dissociation of enzyme activity, failure of normal enzyme response to intraduodenal introduction of olive oil, loss of enzyme activity in successive tests over a period of months or years, and abnormal results to gelatin and vitamin *A* absorption tests. When the sweat test was developed into a simple, reliable and practical test, the patients who had been diagnosed as having partial pancreatic insufficiency were recalled for study. In each of 15 patients tested, the findings for the sweat sodium and chloride concentration were characteristic of patients with cystic fibrosis having complete pancreatic deficiency. It is estimated that 10% to 15% of all patients with cystic fibrosis present themselves with minimal or no discernible evidence of pancreatic enzyme deficiency. This is regarded as an important finding in studying the pathogenesis of the disease, indicating too that the simple estimation of duodenal fluid trypsin is not a reliable index of the disease. The authors discuss details of more elaborate methods for appraisal of pancreatic status. They claim that the prognosis in cystic fibrosis depends not on pancreatic insufficiency but rather on the lung involvement. The recognition of cystic fibrosis in patients with varying degrees of pancreatic involvement permits therapy directed toward the lung infection and the mechanical obstructive phenomena in the lung. The authors believe that this approach has made possible the survival of the majority of patients with extensive lung involvement in their series.

Measles Encephalitis and Corticotropin.

E. APPELBAUM AND C. ABLER (*Am. J. Dis. Child.*, August, 1956) present the results of treatment of 17 consecutive patients with measles encephalitis by means of corticotropin (ACTH). The daily dose varied from five milligrammes to 80 milligrammes, and the total amount of the drug given individual patients ranged in most instances from 100 milligrammes to 320 milligrammes. There were no deaths, and at the time of discharge from hospital only three patients showed residual neurological stigmata. The follow-up study on 16 of the patients showed that 15 had no sequelæ. The shortest follow-up period was seven months, and the longest was three years and nine months. For 14 patients the follow-up period was longer than one year. The sequelæ that occurred in the three affected patients included impairment of vision, loss of speech, euphoria and mental retardation. It is pointed out that the favourable outcome in this series of cases is very impressive. The hormone therapy was instituted early in the disease in most patients. The mode of action by which corticotropin exerts any effect on this disease is unknown. It has been shown that the hormone in experimental encephalomyelitis helps to inhibit granuloma formation, but it is possible that other mechanisms play a part. If measles encephalitis is due to an allergic response of the central nervous system to the virus of measles, then the theory of antibody suppression would seem quite plausible. While this series is too small to permit definite conclusions, nevertheless, the favourable results obtained in all but one case suggest that corticotrophin has a beneficial effect in measles encephalitis. Certainly these results are encouraging enough to warrant further clinical trial in this and other forms of demyelinating encephalomyelitis.

The Schönlein-Henoch Syndrome and Renal Sequelæ.

R. J. DERHAM AND M. M. ROGERSON (*Arch. Dis. Childhood*, October, 1956) present a follow-up survey of 94 patients who were admitted to hospital with Schönlein-Henoch syndrome between 1943 and 1955. During their initial illness 46 of these 94 children had some renal involvement. Two children died with chronic nephritis, and 13 left hospital with persistent albumin and red blood cells in their urine. A recent follow-up study with Addis counts and urea clearance tests showed that nine of these 13 children now had no evidence of kidney disease. The remaining four had developed chronic nephritis. In this series, therefore, the incidence of chronic nephritis is approximately 6%. In addition it has been found that five other children who did not have renal involvement at the time of their original illness, and are now symptom-free, have some impairment of renal function, as shown by Addis counts and urea clearance tests.

Suffocative Goitre in the Newborn.

J. HANDELSMAN AND H. SUSSMAN (*Ann. Surg.*, January, 1957) report a successful thyroidectomy to relieve respiratory obstruction in a six-day-old infant with suffocative congenital goitre. They have found only six other similar cases in the American literature, which they discuss. The children ranged in age from fifteen hours to thirteen months. The authors point out that resection, rather than tracheotomy or irradiation, is the surgical procedure of choice in the face of respiratory distress. They state that reports of goitre in the newborn appear in increasing numbers and that the administration of thiourea derivatives to thyrotoxic pregnant women seems to be the principal cause for this rising rate. However, sporadic cases of congenital goitre continue to appear as well. Prompt surgical intervention may be life-saving in a child so affected.

ORTHOPÆDIC SURGERY.

Paralytic Scoliosis.

J. I. P. JAMES (*J. Bone & Joint Surg.*, August, 1956) considers that the literature on paralytic scoliosis is sparse. He refers to the work of Colanna and Vonn Saal, who reviewed 500 cases in 1941, and disagrees with most of their findings. He has studied 193 patients with paralytic scoliosis, aiming to group them anatomically and to correlate the associated paralysis. He has also studied 208 patients without scoliosis who had limb paralysis. Grouping was difficult because the degree of muscle imbalance and age of onset are more important prognostic features than the site. The site of the primary curve is the main indication of prognosis. The primary curve is structural, and this is visible when the patient bends forward. There is usually rotation as well. It appears that paralysis of limb muscles is not related to scoliosis. There is no statistical relationship between mid-line trunk muscle paralysis and scoliosis. They are related to antero-posterior deformities. Symmetrical paralysis of these muscles causes a collapse of the spine, and thus a non-structural lateral curve. The author considers that this collapse is probably one of the causes of structural lateral curves. Lateral trunk muscles, intercostals, lateral abdominals, and to a small extent the *latissimus dorsi* were weak on the convex side in a significant number of cases. Leverage of ribs produces this deformity when the trunk is not balanced. The estimation of lateral trunk weakness is done by comparison, rather than by charting, which is difficult. The study of the intercostal weakness was instigated by noticing the presence of this paralysis in a high thoracic scoliosis. The author gives details of his method of measurement, placing the hands palm down at the lung apices, nipple line and lung bases. The estimation is for relative weakness, and is not quantitative. He lists the following curve patterns: high thoracic, thoracic, thoraco - lumbar, lumbar, combined thoracic and lumbar, and telescopic spine. The high thoracic pattern has a primary curve level at the first or second thoracic vertebra. This type has a poor prognosis and produces serious cosmetic disability. The deformity is thrown into relief by the compensatory curve of the neck. Fusion should be early and prophylactic rather than curative. Fusion cannot help the appearance once the rib rotation becomes severe. Structural scoliosis does not follow poliomyelitis in adult life. The interval between poliomyelitis and the onset of scoliosis varied from a few weeks to fifteen years. Half the patients developed curvature in one year. The

author notes that paralysis of arm muscles is not thought to be significant in this type of curve. He believes that paralysis of intercostals on the convex side is the significant association of this deformity. He considers that intercostal muscles are still the dominant cause of thoraco-lumbar deformity. Thoraco-lumbar paralytic scoliosis is a mixture. The eleventh and twelfth thoracic vertebræ form the apex. An unknown factor may have been operating as most cases were right-sided, as also were the thoracic curves. Muscle weakness is not easily related to this type of curve. Symmetrical weakness and collapse have seemed to be factors. Of cases of lumbar paralytic scoliosis, only a few are clearly related to irregular lateral abdominal muscle weakness. The apex of the curve is always in the lumbar area. The main curve may extend from the sixth thoracic vertebra down. The prognosis is a little better in this type of curve. Combined thoracic and lumbar paralytic scoliosis is rare. It must be recognized, as fusion of only one curve will lead to a disastrous increase in the other curve. In telescopic spine there is often a considerable difference in erect and supine curve measurements. This is due to weakness of the muscles against gravity. Some patients have flail spines and require long fusion for stabilization.

The Immobilizing Efficiency of Back Braces.

P. NORTON AND T. BROWN (*J. Bone & Joint Surg.*, January, 1957) report on the immobilizing efficiency of back braces. They introduce their subject by stating that braces in use now were designed for Pott's disease and scoliosis. The braces are constructed on the principle of three-point pressure. The correcting force is the middle one, and this acts either from in front or from the back. When they are used after lumbar fusion, the pelvis fixation is usually inadequate, because the pelvic arm is short. The purpose of the study was to determine the effect of back supports on the movement and posture of the lumbo-sacral part of the spine. The study culminated in the development of a new brace to give lumbo-sacral immobilization. Representative apparatus in common use was studied, and included examples of long and short supports, both with and without thoracic bands and lateral uprights. The subjects were males, aged twenty-three to fifty-one years. The authors state that measurement of spinal movements by means of röntgenograms is notoriously inaccurate, and to test ten braces on the one subject would mean too much exposure. To avoid this, Kirschner wires were inserted into the lumbar spinous processes, and the subject was photographed against an angled grid. The results needed continuous interpretation. The forces between the back and the supports at various levels were determined by pressure-recording devices developed at the Massachusetts Institute of Technology. Efforts were made to record the pressures between the body and straps and cross bars of the braces, but this was not satisfactory. An electric potentiometer was used to measure the angle of forward bend. It was reasonably satisfactory and had an error of $\pm 5°$. The results noted were not all conclusive, but were of great interest. Fixation to thorax but with inadequate pelvic grip meant that the restraining force was concentrated in the upper lumbar and thoraco-lumbar regions. This limited movement in this region, but left the lumbo-sacral segments unsupported. This was noted with Taylor or Thomas type braces and plaster jackets. In contrast with these types, short supports such as Goldthwait and chair-back types, with little fixation to the chest but relatively well secured to the pelvis, did not pull away from the pelvis during forward bending. Relatively less force was exerted, but it all acted on the lumbo-sacral area. X-ray studies showed that in some subjects the long braces, by concentrating on the thoraco-lumbar region, increased the range of movement of the lumbo-sacral joint. It was noted that the site of greatest flexion varied with the individual. Peculiar phenomena, such as extension of the fifth lumbar space during the first 15° of forward bending, were noted. The degree of lumbo-sacral flexion during sitting was great, even in the erect position. In the slumped position flexion observed in the fourth lumbar space was greater than in forward bending. In the sitting position conventional supports decreased the lumbar flexion, but never completely prevented flexion. As the study progressed, it was decided to develop a brace which would apply sharply localized pressure at the lumbo-sacral area and be comfortable with the subject standing and in the erect sitting position. Pressure was localized over the posterior superior spines of the ilium by means of a transverse bar. Mid-lateral bars replaced the paraspinal uprights. These uprights are joined over the thorax at the level of the inferior angle of the scapulæ; groin straps and the lower straps of a large abdominal pad are attached to the lower end of the axillary uprights through a disk which is free to rotate.

Intertrochanteric and Subtrochanteric Fractures of the Femur in the Negro.

L. R. ROBEY (*J. Bone & Joint Surg.*, December, 1956) presents 99 unselected cases of intertrochanteric and subtrochanteric fractures of the femur in the Negro. He notes that Cleveland reported this type of fracture to be rare in Negroes. This is discounted by the author. In this series there were 45 males and 54 females. Ages ranged from twelve to one hundred and one years. The average age in males was 55·7 years, and in females 70·7 years. Severe trauma was the usual cause of fracture in the males, who were therefore a younger age group than the females, who were usually injured by falls in the home. The women belittled the injury and hence reported very late for examination and treatment. Usually they remained in bed at home. This delay amounted to an average time of seventy-eight hours after injury. It was noted that the average delay before admission to hospital and operation was forty-four hours among survivors. In the group that died the delay averaged seven and a half days. The author considers that the inexcusable delay was reflected in the mortality rate. Most of these patients were indigent. Malnutrition, dehydration, chronic anæmia and other untreated disorders occurred frequently. Only five of the 99 did not have at least one of these disorders as well as the fracture. Many had other fractures, cerebral concussion and crippling arthritis. The series included nine hemiplegics, two paraplegics, 40 patients with hypertension, 23 patients with calcified femoral vessels, 10 patients with cardiac decompensation, as well as others with senile psychosis, diabetic coma and alcoholic stupor. The author states that in the early period of the study only the young "good-risk" patients were treated by operation and internal fixation. Now it is the "poor risks" that have the internal fixation. He applies the concept of Kay concerning intracapsular fractures that the truly conservative method of treating a fracture through the neck of the femur is to operate, especially in the aged. There were exceptions to this policy. Some patients were so ill on admission that supportive measures alone were possible. In others the degree of comminution of the fracture was so severe that little could be hoped for internal fixation alone, and prolonged post-operative immobilization was necessary. The author emphasizes the importance of good röntgenograms to achieve a good operative result. He infiltrates the area with 1% "Novocain" solution before he moves the patient to the operating room. The method is the guide-wire insertion of a Neufeld nail. He notes that excessive internal rotation of the limb, the method of reduction in intracapsular fractures, usually increases the displacement of the fragments. Ambulation is started in one to three days. He does not hesitate to apply traction for three to four weeks if the fixation is not sound. Weight-bearing is not begun until the fourth or sixth month. The mortality rate based on the total number of deaths occurring in the hospital, including patients admitted in the terminal state, was 36·6% in the non-operative group—that is, double the mortality rate in the operative group.

The Perpendicular in Relation to Walking Casts.

R. RUDING (*J. Bone & Joint Surg.*, December, 1956) discusses the perpendicular in relation to walking casts. To permit free rocking movement of the foot during walking, walking irons or heels are made with a small contact surface to the ground. To avoid abnormal stresses, the walking iron or heel must be placed exactly beneath the centre of gravity. The author reports a study of 90 healthy army recruits to determine the point where the centre of gravity intersects the supporting plane of the foot. He lists the following points as important if the heel is to be correctly placed. These points were determined during the investigation by means of simple apparatus, simple measurements and calculations. The heel should be placed: (i) midway between the calcaneal tuberosity and the "anterior foot" (the "anterior foot" is the mid-point on a line connecting the first and fifth metatarsal heads), or (ii) just anterior to the mid-point of the line joining the ball of the foot and the back of the heel. Also, the shoe of the normal foot must be built up to keep the pelvis level.

Special Article.

MEDICAL EFFECTS OF THE ATOMIC BOMB IN JAPAN.

THE explosion of atomic bombs in Japan in August, 1945, provided the first opportunity to observe the effects of huge amounts of γ radiation on a large population. An American Joint Commission was appointed to observe and report on these effects, and the results of their investigations are recorded in an important volume.[1] This is condensed from a large six-volume report in which the findings of the Commission are collated, organized and submitted to a thorough statistical analysis. The result of this condensation is a terse factual account requiring close and careful reading, but of great importance from the point of view both of clinical medicine and of civil defence. The editors, who were senior members of the Commission, are now respectively Clinical Professor of Surgery at Yale University School of Medicine and Professor of Radiology at Harvard Medical School. It is hoped that the following summary will stimulate many of our readers to the careful study of the book which it merits.

The bombs used in Hiroshima and Nagasaki were not exactly nuclear. The bomb at Nagasaki was slightly stronger and was exploded 300 feet higher than that at Hiroshima, but the types of damage produced were identical. Each explosion caused hazards of blast, radiant heat and ionizing radiation, which will always be the important factors, however the design and use of atomic bombs may vary from the earlier models used in Japan.

Hiroshima is located on a broad, flat delta; the bomb burst over a congested commercial area with many wooden hovels, and 60% of the population were within one to two miles of the explosion. In Nagasaki only 30% were so situated; the town is built on a series of valleys, which afforded shelter to about a quarter of the population, and the area most exposed was mainly industrial. In Hiroshima the area of total destruction was four square miles; of 90,000 buildings within 9·5 square miles two-thirds were destroyed or badly damaged; all wooden buildings within 1·5 miles of the hypocentre (the point immediately under the blast) were completely destroyed and brick buildings reduced to rubble. Thousands of fires broke out, rapidly covering an area of 4·5 square miles. With streets obstructed by rubble, interrupted water supply and failure of electric power, little could be done to check the fires. In Nagasaki factories responsible for 90% of the industrial output of the city were put out of action; although some residential areas were sheltered, of 54,000 houses 14,000 were destroyed. Fires were not such a serious problem as at Hiroshima, but all buildings within half a mile of the hypocentre were gutted; the farthest limit of firespread was about two miles.

Blast was the main destructive factor by demolition of essential facilities, particularly hospitals and fire stations, and indirectly by causing extension of domestic and industrial fires and by blocking roads and bridges. Radiant heat caused extension of fires by igniting combustible materials, an influence which extended for two miles. Ionizing radiation caused no damage to buildings, but was an important cause of casualties. There was no contamination of buildings or ground areas by residual or induced radiation. Estimation of the number of casualties was very difficult, but the following figures are considered to be reasonably accurate: died on first day: Hiroshima 45,000, Nagasaki 22,000; injured on first day: Hiroshima 91,000, Nagasaki 42,000; dead in four months: Hiroshima 64,000, Nagasaki 39,000. This gives some idea of the medical problem.

The various factors influencing the catastrophe are fully analysed: surprise, nature of terrain, density of population, distance from hypocentre and shielding in buildings, which in this instance were mostly wooden with a few of reinforced concrete. The very difficult problem of providing adequate shielding against ionizing radiation is discussed at length.

The section of the report dealing with the effects of the explosion on medical care and facilities is of special importance in regard to the planning of civil defence. The following is a quotation:

> In Hiroshima most of the medical facilities were in the devastated area and the larger part of them were susceptible to blast and fire; consequently casualties were heavy. Ninety percent of the 200 to 300 physicians were killed or injured and at least 60 were killed outright. About 60 physicians were able to give medical care despite their injuries. Over 90 percent of 1800 nurses were casualties. According to another report 1800 of 2400 nurses and orderlies were killed or injured. Many of the injured nurses were able to work, but the shortage of trained personnel was so grave that many untrained volunteers had to be pressed into the service.
>
> In Nagasaki, most of the medical personnel were in the Medical College and the University Hospital, which were within half a mile of the hypocenter and were almost completely destroyed. Of the 20 faculty members at the College twelve were killed and four were injured: 600 of the medical students were killed and most of the others were injured. At the University Hospital eighty percent of the occupants were killed or fatally injured. Nearly half of the medical practitioners in the city were killed or seriously injured. Three months after the bombing only one half of the 240 physicians, in the city prior to the explosion, were working.

Several hospitals of varying size within half a mile of the explosion were completely destroyed, with a mortality of 100%, and two large modern reinforced concrete hospitals a mile away had a casualty rate of 90%; their equipment and supplies were either destroyed or rendered useless. They were utilized as out-patient clinics or shelters. Even at two miles' distance from the hypocentre a modern army-navy hospital was badly damaged, and there were numerous injuries from flying debris. The Medical College in Nagasaki consisted mostly of wooden buildings, which accounted for the high mortality amongst medical students. The medical buildings destroyed contained 75% of the hospital accommodation in the town and most of the medical facilities; 80% of the occupants died. Most of these buildings were of earthquake-proof reinforced concrete construction, but they contained much wood in their interiors, and most of them were gutted by fire. Medical supplies for Hiroshima were stored in neighbouring villages and remained intact, but were quite inadequate to meet the demand.

At Nagasaki medical supplies were available in neighbouring towns, and many of the casualties were treated in adjacent naval hospitals, but smaller hospitals were very inadequately equipped. Fluids for intravenous administration and sulphonamides were in very short supply, and no penicillin was available.

Early rescue work in Hiroshima was impeded by widespread panic, rapidly spreading fires and obstructed streets. Red Cross services were organized early on a limited scale, but the care of the injured was for a time largely a responsibility of relatives. Civil defence workers and police arrived in force the day after the explosion, but there was no organized medical service for three days. The Army then assumed responsibility for both civil and military casualties.

In Nagasaki, where there were fewer casualties and less extensive fires, conditions were comparatively better. Army relief trains arrived in the city on the afternoon of the explosion, and full use was made of the naval hospitals. The problem of medical care still remained very acute because of the extensive destruction of accommodation and facilities.

The condition of the survivors is described thus by one of the naval medical staff: "The patients' hair was burned, their clothes were torn to pieces and stained by blood, and the exposed skin was burned and inflamed. The wounds were contaminated by filth. Many people had numerous pieces of glass and wood projecting from the face and back." Because of shortage of supplies and equipment and reduced medical staffs, treatment was substandard and probably had no significant effect in reducing the mortality rate; but the editors think it doubtful whether more than 5% or 10% of the deaths from all injuries could have been prevented even if adequate quantities of plasma and fluids for parenteral use had been administered to patients with burns and whole-blood transfusions to those with radiation injuries.

The identification and disposal of the dead (they were cremated), the location of injured survivors, and the feeding and accommodation of an already malnourished populace were some of the additional problems confronting a harassed civil defence organization. Fortunately there were no major epidemics, probably because of a large exodus of the population. Conditions were certainly very favourable to epidemics

[1] "Medical Effects of the Atomic Bomb in Japan", edited by Ashley W. Oughterson and Shields Warren, National Nuclear Energy Series, Manhattan Project Technical Section, Division VIII, Volume 8, First Edition; 1956. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 9½" × 6½", pp. 493, with illustrations. Price: $8.00.

with an interrupted water supply, uncollected garbage and excreta, swarms of insect vectors and a shortage of disinfectants.

Clinical observations are carefully recorded with numerous case histories and excellent photographs. Blast injuries among survivors were usually indirect and frequently due to pieces of glass which caused multiple wounds, commonly involving peripheral nerves and vessels. Fractures were infrequent, and repair was slow, as radiation injury and burns complicated their treatment. Wounds healed slowly. A Tokio hospital reported: "Healing of wounds was prolonged coincident with the appearance of typical symptoms of radiation effect. The granulation tissue became anæmic and œdematous. It bled easily and became dry because of unusual decrease of secretions. The borders of the wound were undermined: growth of granulation tissue stopped and no tendency to heal was shown. In other cases the wound enlarged gradually until death." Superficial infection was almost invariable, and deep infection was common. Gangrene and tetanus were rare. Most of the patients were malnourished, and treatment generally was inadequate. Amongst survivors over 90% of burns were due to radiant energy acting at effective intensity for approximately three seconds; many early deaths were due to flame burns, particularly when there were concurrent blast injuries. Shielding by buildings gave a high degree of protection, but exposed skin in the open suffered severely. Except in the inner zones, clothing afforded some protection, varying according as it was light or dark, patterned or plain, thick or thin, tight or loose. Window glass offered almost no protection. In Hiroshima flash burns were noted at distances up to 2·79 miles, but rarely required treatment at distances over two miles. In Nagasaki flash burns were noted at distances up to 2·48 miles; where skin was directly exposed at distances within 1·24 miles burns were usually of third degree. It is difficult to separate radiation and heat as causal factors of mortality, but deaths occurring within a few days are generally attributed to flash burns; for instance, of 51 school girls playing out of doors at 2500 feet from the hypocentre, all died within a week, and among 193 workers fully exposed at 0·6 mile the mortality was 95%. The clinical aspects of the various degrees of burns, with their sequelæ and complications, are fully discussed.

In regard to ionizing radiation the Commission was faced with the task of determining the exact nature of the disease syndrome due to larger dosage—its signs, symptoms and pathology with their relative frequency and importance, and the question of which of them were specific and which were merely suggestive. The incidence, time of onset, duration, prognosis and general significance of the relevant symptoms are discussed at great length in what is the most important section of the book. The conclusion reached is that the most specific symptoms are epilation and purpura; next in order of importance are oro-pharyngeal lesions, vomiting on the day of the explosion and various forms of hæmorrhage. In a well-developed case diagnosis is easy. In milder cases there is often doubt, and they may be overlooked. Leucopenia is one of the earliest signs. In severe cases counts were as low as a few hundred cells per cubic millimetre; patients with counts as low as 500 per cubic millimetre rarely recovered. Leucopenia was occasionally found in exposed personnel who showed no obvious symptoms of injury. The incidence of radiation injury in Japanese wooden buildings at 0·62, 0·93 and 1·24 miles from the hypocentre was, in Hiroshima, 85·9%, 38·6% and 10·1% respectively.

Hæmatological investigations were performed on a large number of patients who were exposed to irradiation. Although there were few serial investigations on individual patients, a clear picture has emerged from an analysis of the findings on patients who were examined at different times after the explosions. Both the peripheral blood and the marrow tissue changes are presented in chapter six, which includes 55 tables and 54 photomicrographs. The photomicrographs throughout the book are of a particularly high standard.

The different cellular elements were thoroughly studied, and brief mention is made of the hæmorrhagic condition which was commonly encountered. No investigations were, however, made of changes in the plasma proteins or other plasma constituents. A decrease in the red cell count and hæmoglobin value was found in the early stages, and reached its lowest level in non-fatal instances between the sixth and eighth weeks, after which the values gradually returned to normal. Leucopenia was an early and constant finding, the white cell count falling to the lowest level after sublethal irradiation in the fourth week and returning to normal in a further four weeks. Thrombocytopenia was less constant in patients who recovered, but universal in fatal cases.

Altogether 258 bone marrow examinations were made, the majority from Nagasaki. The definitive cells of hæmopoiesis were greatly reduced in number or destroyed in the early stages, and this was followed by proliferation of the reticulo-endothelial tissue. Evidence is produced that regeneration occurred largely from this reticulo-endothelial tissue. The average time for recovery of the marrow tissue was between twelve and sixteen weeks, but the regeneration of the erythropoietic tissue was slower than that of the granulopoietic tissue. Sometimes regeneration was incomplete or absent. A statistical study amongst survivors suggests that leuchæmia may have increased in incidence during the next three to nine years.

A paper published in 1949 describing the pathological findings is reproduced in chapter seven. The material was obtained from 170 autopsies, but only 110 were used in the tabular presentation. The histological material was reviewed at the Armed Forces Institute of Pathology in Washington. The results of the very detailed study are presented in the form of frequency distribution tables of the characteristic findings for each tissue, and whenever possible are related to the distance from the point of explosion. There are 134 excellent illustrations and 44 tables.

It is explained that as far as possible the study was limited to the effects of ionizing irradiation, and material from patients with other injuries was not included. It was, however, difficult to dissociate the changes produced by irradiation from those of bacterial invasion, which was very common because of the leucopenia. The material is well presented and makes interesting reading.

The most characteristic changes, apart from those in the bone marrow, were seen in the skin with epilation, in the testes with loss of germinal epithelium, and in the gastro-intestinal tract with hæmorrhage and ulceration. In the ovary there was usually an absence of developing follicles, despite the persistence of primary follicles. The endometrium showed an absence of *corpus luteum* effect. There was, however, no evidence of permanent effects on either the testes or the ovaries. No knowledge was obtained from these studies of the effect of irradiation on bony growth.

Conclusion.

Since 1945 the destructive power of atomic and other bombs has been mostly increased. Long-range aircraft and the development of guided missiles have facilitated their delivery to any target, however remote, even Australia. Experience in Japan showed that as three-fourths of all deaths occurred before medical aid could become effective, chief reliance in the reduction of mortality must be placed on preventive measures; it also proved that effective shelter would provide adequate protection except in case of a very close burst. This book is recommended for close study, both for its clinical interest and as a very necessary stimulus to the development of plans for civil defence, which still seems to be regarded as a matter of only secondary importance.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held in the Medical Society Hall, 426 Albert Street, East Melbourne, on November 14, 1956.

Bronchitis, Asthma and Emphysema in Childhood.

DR. A. L. WILLIAMS read a paper entitled "Bronchitis, Asthma and Emphysema in Childhood" (see page 781).

DR. STANLEY WILLIAMS read a paper entitled "Ætiology and Diagnosis of Bronchial Asthma, Bronchitis and Emphysema in Children" (see page 782).

DR. IVAN MAXWELL read a paper entitled "Treatment of the Asthmatic Child" (see page 783).

DR. R. H. O. DONALD, in opening the discussion, said that no matter what type of practice a medical officer carried on, the diseases under consideration were important. He was sure that every practitioner must encounter children affected by them at some time. It was important therefore that

they should be recognized at an early stage, and proper investigation and treatment instituted. It was most important that the respiratory tract should be studied as a whole in the affected patients. For good results to be obtained it was necessary that the upper part of the respiratory tract should be properly examined, investigated, and treated along with the lower part of the respiratory tract. Dr. Donald saw a number of children with recurrent asthma and bronchitis who had never had an X-ray picture taken of the nasal sinuses, and in some cases the nose and throat had not even been examined clinically. It had become more generally recognized that allergy often played a major role in many respiratory diseases, and when a child presented with recurrent and frequent upper and lower respiratory infections, especially if there was a family history of allergic disease, then this child should be subjected to thorough and immediate allergic survey. A thorough and complete history was necessary in particular to discover whether the child was worse in any particular area or habitation, if dust, animals, foods *et cetera* brought on symptoms. He said that skin tests could be of great help, but the testing must be thorough. Incomplete testing often led to important allergens being missed. The skin testing should be done by, or under the direct supervision of, the practitioner who had taken the history. If necessary, the tests should be repeated, and sometimes it was wise to correlate the results with a clinical trial by bringing the patient into contact with suspected allergens.

He said that much chronic invalidism in later life could often be avoided if prompt and thorough allergic investigation and treatment were carried out in children who developed symptoms, and especially when there was a family history of allergic diseases. In other words the disease should be recognized and treated early. In Dr. Donald's opinion, once a patient was allergic, then that patient was always likely to be allergic. The allergic conditions might be controlled over a considerable period, but the so-called allergic diseases were likely to recur later in life, especially if the patient came into contact with a high concentration of an allergen to which he had previously been sensitized. If a child grew out of the disease at some magic age, such as seven or fourteen, then, probably, it had never been truly allergic. He went on to say that the ciliated membranes lining the respiratory tract were of great importance, and in any diseased condition it should be their aim to do everything possible to restore the ciliated membrane so that it could carry out efficiently its normal physiological function. The ciliated membrane had a very thin film of mucus overlying it, and it was essential that that film should remain intact and yet be kept constantly in motion by the cilia. The mucus ensnared and destroyed many invading pathogenic organisms. The bodies of those, and other debris which collected, were swept along in the stream of mucus by cilial action. If there was a break in the stream of mucus, pathogenic organisms could gain access to the subepithelial tissues where they met a second line of defence. The cilia had been observed to beat in such a way that the stream of mucus flowed in one direction, which in the nose was posteriorly towards the naso-pharynx, and in the lungs cranially towards the pharynx. In the nasal sinuses they beat towards the ostia where the stream of mucus converged. It had been observed also that they beat more vigorously in certain areas such as beneath the turbinates and at the ostia. Many local medications and operative procedures interfered with the normal physiological action of the cilia in the nose, nasal sinuses, trachea and bronchi, by placing barriers in the moving stream of mucus. Likewise, many diseases of the nose, nasal sinuses, trachea and bronchi would interfere with the normal physiological action of the cilia. Therefore operative procedures on the nose and sinuses had recently not been as tissue destroying as they had been in the past. Operations in the ciliated areas necessarily must have left some scarring in the ciliated membrane, and in many cases the delicate cilia had difficulty in moving the stream of mucus over the scars, with consequent banking up and secondary infection through stagnation. Likewise, nasal drops with an oily base frequently overloaded the cilia and caused stagnation. Therefore nasal drops should be prescribed in an aqueous medium. In treating the respiratory tract of these children with asthma, so-called allergic bronchitis, or emphysema, the normal tract with its cilial action should always be kept in mind and methods adopted towards obtaining a good airway, and overcoming any allergic and infective states present. He said that allergy was treated by the removal of offending allergens, by careful desensitization, and by the use of antihistamine and other drugs. When superadded infection was present, and this was frequently so, or if the case appeared to be one of bacterial allergy, measures must be taken to treat them. A series of antral washouts together with penicillin, sulphonamide or other antibiotic therapy would cause the infection to resolve in many instances when the nasal sinuses were involved. If infected tonsils and adenoids were present, they should be removed. He did not advocate the wholesale removal of tonsils and adenoids, but when adenoids were definitely obstructing the naso-pharynx and thus preventing proper posterior nasal aeration and drainage, or if recurrent attacks of tonsillitis occurred, then the tonsils and adenoids should be removed thoroughly. Once a clearer nasal airway was obtained it was often much easier to treat the trouble in the lower respiratory tract. Many children developed asthma and bronchitis along with upper respiratory tract infections, and every endeavour should be made to avoid contact with other people who had colds. The child should be warmly dressed, especially in winter, and it was wise to avoid sudden extreme changes of temperature. Sleeping alone in a dust-free room on a rubber mattress and rubber pillows frequently helped these children, especially those with house dust and kapok sensitivities. Breathing exercises under the guidance of a properly trained physiotherapist could be of considerable value, but the parents should be warned that this was only part of the necessary treatment, otherwise a number of people seemed to think there was no need to do much else so long as little Johnny did his exercises. The general treatment of these patients had already been thoroughly outlined by the other speakers, but there were two further points to be made. In cases of severe asthma moistened oxygen was of great value. It was best given through a well-fitting mask or a nasal catheter. Oxygen tents were not so effective. An intravenous transfusion of glucose 5% in normal saline was frequently of great help. The liver had possibly already been depleted of glycogen by frequent doses of adrenaline, and the transfusion helped to restore the fluid and carbohydrate balance. Great care must be taken with small children to see that they were not given too much saline.

DR. CHARLES SUTHERLAND said that one of the major problems in asthma, bronchitis and emphysema in children was the prognosis. He asked why pertussis was so sinister in asthmatics, as there was no question that those who had had severe pertussis and those with persistent infantile eczema had a bad outlook.

DR. A. L. WILLIAMS, in reply, said that he considered bronchiolitis of pertussis with resultant scarring to be a contributing factor, particularly with the superadded bronchiolar changes resulting from the asthma itself.

DR. P. WARD FARMER thought that not sufficient stress had been placed during the symposium on case histories. They were most important. Had there been recurrent infections? Were they allergic cases? The important allergens were inhalants and foods, skin tests often being a good guide to the cause. Elimination diets were helpful, as many eczematous children reacted to egg white, cereals and milk. Desensitization should often be combined with anti-infective treatment, and if patients reacted strongly to allergens, desensitization over a long period was of value. He considered that in asthmatics between the ages of one and ten years perhaps 50% of asthmatic states were of infective origin and 50% allergic. He stated that he was very chary of intravenous administration of aminophylline, as deaths had been reported, and it was much safer to give it *per rectum* or intramuscularly. In his experience the eczematous-asthmatic child often responded well to treatment of his asthma, but not of his eczema.

DR. GERALD DOYLE said that Dr. Williams, as a pathologist, had drawn attention to one most important fact—the tenacious mucus of the asthmatic, and in his opinion the amount of sputum was inversely proportional to the symptoms. If the attack was centred on the small bronchioles with no cartilaginous rings, it was much more severe; and if the sputum could be got rid of, then the attack became much easier to control.

DR. STANLEY WILLIAMS, in reply to Dr. Doyle, said that in his opinion the mucus was expectorated when the spasm was relieved.

DR. IVAN MAXWELL, in reply to a series of questions from Dr. Cordner, said that both in adults and in children aminophylline intolerance might occur, but the dosage he had suggested was the correct one. He considered that there was some danger in the use of corticosteroids in children, but some patients were so debilitated and unfit to lead a normal life that the use of prednisolone was justified. Theophylline and adrenaline as an aerosol were effective.

DR. R. H. OXBY DONALD, in discussing the control of the nasal allergic state, said that tonsils and adenoids should not be removed indiscriminately. The "soggy" nose could be controlled with a long course of desensitization if the offending allergen could be detected. The most difficult cases were the hyperallergic ones with superimposed infection, and in those cases both the infection and the allergy should be attacked. Decongestive nasal drops were of value, and the antihistamines were often of help, particularly in the seasonal cases.

DR. P. GOODMAN said that he had found prophylactic doses of sulphonamides of value for patients with recurrent infections.

DR. ROBERT SOUTHBY said that he had had no experience in treating asthmatics with sulphonamides, but prolonged administration of those drugs was of value in rheumatic children. The allergic child very frequently had a family background of allergy; while infection was important, allergens were of equal importance, and another big factor in precipitating an attack was the emotional one. He asked at what age skin testing should first be done, and said that in his experience there was sometimes no reaction to skin tests and sometimes a multitude of reactions. He mentioned that in an overseas clinic he had seen 96 intradermal tests performed on a child.

Dr. Maxwell, in reply to Dr. Southby, said that intradermal tests could be dangerous, and he never did more than six or eight at a time. He had found over the years that he did less intradermal testing now than formerly, and by using his clinical judgement tried only the allergens likely to give a reaction. Also, he now did less desensitization than formerly, but still thought it of value in the pollen-sensitive subjects in the months preceding the pollen fall. The house-dust-sensitive subject was constantly exposed to his allergen, and Dr. Maxwell saw no value in attempting to desensitize such patients. When food allergy was suspected in babies, he did prick tests, but no intradermal tests, and desensitized them by elimination of the offending food. At seven to eight years desensitization might be justified, but not in a terrified child who feared injections. Dr. Maxwell was of the opinion that the psychological factor was not so important as some maintained.

DR. E. W. CHENOWETH said that it was a common experience for allergists to have referred to them asthmatics who had had a chest X-ray examination, but it was uncommon for a referred patient to have undergone X-ray examination of the sinuses. He considered that radiological examination of the sinuses was more important than that of the chest, but interpretation could be difficult. Was the sinus infected or occluded by allergic œdema of the mucosa? An antrum washout might be necessary before a decision could be made, and, if pus or mucopus was obtained, appropriate treatment was indicated. A negative finding from a washout, however, did not necessarily exclude infection, as bacteria could be present in the mucosa without pus formation. If he was satisfied that sinus infection was present, he attacked it locally with anti-infective and constricting nasal drops ("Argotone") combined with the use of an infra-red lamp in the patient's home, *plus* general treatment with sulphonamides or antibiotics if appropriate. He had found that the use of non-specific influenzal or coryzal vaccine was often helpful.

DR. GEORGE SWINBURNE, in discussing the local use of antihistamines and antibiotics in the nose, said that he thought they were of no use; at the same time it was dangerous to use sulphonamides locally as sensitization might occur. He considered that emotional upsets did precipitate asthmatic attacks. He questioned Dr. Chenoweth's use of concurrent vasoconstriction and heat, as he considered they would produce opposite effects. At the Royal Melbourne Hospital he had treated infective subjects in three groups: those in group 1 were given appropriate treatment after culture and sensitivity tests had been done; those in group 2 were given short-wave diathermy; those in group 3 were given no treatment except nasal drops and inhalations. The patients in group 1 showed the best results, and there was no detectable difference in the results in groups 2 and 3. He considered that short-wave diathermy did no more than produce heat in the mucous membrane and congest it, and he felt that it was of no use. He stated that children were resilient and recovered quickly from infections. He found them less difficult to treat than adults; and, while skin tests and histories were helpful in deciding which cases were allergic, clinical examination was most important, as the allergic nose and the infected nose were quite different and easy to distinguish. In some cases he found that antihistamines were of help. The best vasoconstrictor drops were a 1% "Neo-Synephrine" solution.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

INCREASED COST OF TRANSPORT.[1]

[From the *New South Wales Medical Gazette*, July, 1874.]

MEDICAL PRACTITIONERS are concerned perhaps more than any other section of the community in the increased rate of cab hire. We understand that the fare for the use of a hansom cab has been raised to four shillings for the first hour and the same amount as was paid before, namely three shillings an hour for any time (exclusive of mileage) during which the vehicle may be occupied in the day, up to ten oclock at night when it is increased to six shillings per hour. We imagine enough is paid already: at least we find it one of the heaviest items of our expenditure. We remember being called early in the morning on one occasion by telegram to visit a lady at South Head, when we proceeded in a two-horse carriage and were back in town at about nine oclock—for this we paid one guinea. Having a great deal of visiting to do on the same day we retained the carriage at four shillings and sixpence per hour for eight hours and found that at the end of the day's work, with paying tollbars, we had put our hands in our pocket to the tune of three pounds sterling. Surely this should be enough to remunerate any cabby: and we believe this increased rate has not been desired by the drivers themselves, who state it is the Commissioner's fault. Anyway medical men should take steps in the matter, as we scarcely believe the patient will be inclined to pay the six shillings per hour night fare when the doctor is rung up at three in the morning to attend a midwifery case or other urgent call.

Correspondence.

FAT INTAKE AND CORONARY DISEASE.

SIR: The editorial of May 4, in drawing attention to the relationship between fat intake and the incidence of coronary disease, refers to milk as "slow poison" and supports the suggestion of Dr. Dock that corn oil replace dairy products in the diet. In this, as in some other recent pronouncements on coronary disease by the medical profession, there is evidence of a degree of reaction against the dietary value of dairy products which is far from justified by established facts.

The experimental evidence in this field is as yet only fragmentary, and the picture is changing rapidly. Whereas a year or so ago one could speak of animal fats as more harmful than vegetable fats, it now appears that it is the content of the fat in essential fatty acids, and not its origin, which is significant.

Some of the experimental evidence conflicts with long-term observation. For instance, in some countries a considerable proportion of the population were drinking much milk and eating much butter long before figures for heart disease commenced to climb. And in Great Britain since World War I there is a correlation of deaths due to heart disease with increasing consumption of hydrogenated fats, but not with consumption of butter.

Dr. Charles May, chairman, Department of Pediatrics, State University of Iowa, is quoted in *The Journal of the American Medical Association* (December 15, 1956) as saying, in connexion with heart disease: "When knowledge seems sufficiently certain to justify application, great caution must be exercised in manipulating the diets of populations lest unanticipated deficiencies or imbalances are created. Interesting but unproved leads must not be made the basis of dietary recommendations."

Dr. Ancel Keys, who was referred to in the editorial, recently stated: "The present average adult diet contains at least 40 per cent. of calories from fat. This should be cut to 25 per cent., and the safest way for us to lower our fat intake is to eliminate the processed and chemically manipulated fats which are newcomers to our diet. The other fats

[1] From the original in the Mitchell Library, Sydney.

such as butterfat, meat fats, the fat in poultry and eggs are combined with high quality proteins and essential minerals and vitamins. We do not want to reduce intake of these nutrients and reduce the quality of our diet."

May I suggest, therefore, that in this rapidly developing field, pronouncements which may be brought before the public should be made with restraint until the scientific picture is far clearer than it is at present, and should give due attention to all the dietary factors involved.

Yours, etc.,

G. LOFTUS HILLS,
Officer-in-Charge.

Commonwealth Scientific and Industrial Research Organization,
Dairy Research Section,
P.O. Box 20,
Highett,
Victoria.

May 24, 1957.

THE MEDICAL PROFESSION AND THE PLIGHT OF THE ABORIGINES.

SIR: Dr. Barry E. Christophers has done well to remind the profession of disquieting reports about the plight of the aborigines.

As citizens claiming a paramount interest in matters of health, members of the British Medical Association cannot ignore the report of conditions amounting to starvation amongst aborigines of the Laverton and Warburton Range area. The original report came from responsible men who had spent five weeks in the area. Their report raised serious doubts concerning the welfare of aborigines there, and nothing which has appeared since has satisfactorily disposed of those doubts. The splendid service rendered without discrimination to the aboriginal and the white populations of our inland by the aerial medical services is well known—but this report refers apparently to nomadic natives not likely to come into contact with such services.

The question as to whether this matter is best dealt with by the setting up of a "Commonwealth Department of Native Affairs"—as Dr. Christophers suggests—is perhaps a matter of opinion. I, for one, intend to seek more information on the subject. There can be no doubt, however, that the report and the films referred to should be sufficient to awaken the serious interest of Australian doctors as to the best methods of ensuring that the "Rights of Man" are available to a people who have not so far shared in the growing prosperity of this country.

Yours, etc.,

BERWYN L. DEANS, M.D., D.D.R., M.C.R.A.

7 Gwenda Street,
Box Hill South,
Victoria.

May 21, 1957.

THE TREATMENT OF ORCHITIS IN MUMPS.

SIR: During a recent post-graduate meeting in Sydney, a question was asked about the treatment of epididymo-orchitis in mumps, and if it was possible to prevent atrophy of the testis with cortisone.

The recommendation by Hoyne *et alii* to treat this complication with œstrogens is apparently not sufficiently known. "Current Comment" of November 19, 1949, discusses this treatment.

My experience of the treatment with large doses of stilbœstrol comprises two cases. The results were striking. Oral administration of five milligrammes of stilbœstrol four times daily caused the temperature and the testis to return to normal on the third day, the complication having started with high fever and painful, swollen testis. In the first case prophylaxis with five milligrammes of hexœstrol did not prevent the orchitis.

This good effect can be explained by the fact that orchitis as a complication of mumps is hardly ever seen in children; the virus apparently does not affect the inactive testicle. (This is contradicted by N. K. Connelly, who diagnosed orchitis due to the mumps virus in infants.)

In mumps orchitis the patients are usually very ill, with high fever and severe pains for about a week, with a prolongation of the illness for two to three weeks or even longer. There is always the possibility of sterility. The cheap and apparently harmless treatment with synthetic œstrogens is therefore urgently advised, but it has to be stressed that large doses should be used.

For prophylaxis one to two milligrammes of stilbœstrol four times daily may be given to adults, but when the orchitis occurs before the swelling of the salivary glands or even without this becoming overt, prophylaxis will be impossible.

Yours, etc.,

D. VAN DER POORTEN.

143 Bellevue Road,
Bellevue Hill,
New South Wales.

May 25, 1957.

HEPATITIS.

SIR: It is with great interest and admiration that we have read of the work of the Clinical Research Unit of the Royal Melbourne Hospital in the papers on "Lupoid Hepatitis" presented by Mackay *et alii* in *The Lancet*, and by P. M. Last on "The Treatment of Active Chronic Infectious Hepatitis with ACTH and Cortisone" in THE MEDICAL JOURNAL OF AUSTRALIA.

The dermatological department of Royal Newcastle Hospital has, over the past few years, taken a great interest in systemic *lupus erythematosus*, and from our experiences and from the perusal of the literature we believe that lupoid hepatitis is not purely due to infection, but possibly may be triggered by infection. We feel, therefore, that the assessment of the value of the steroid hormones in this condition is clouded by the idea that so-called "lupus hepatitis" is solely due to an infection, and not to one of the protean manifestations of the disorder systemic *lupus erythematosus*.

The importance of this concept, when considering the value of the steroids in treatment, lies in the fact that if lupoid hepatitis is a manifestation of systemic *lupus erythematosus*, the dosage of steroid mentioned in the article may be inadequate to control the condition in some cases. We have found it necessary to use up to 800 milligrammes of cortisone acetate daily to produce improvement in an acute exacerbation, and we have read of the use of 1200 milligrammes daily. We think it is possible that the use of more heroic dosage schedules in those cases who fail to respond quickly and satisfactorily to smaller dosages might have resulted in a more favourable conclusion of the value of the steroids in these conditions.

Yours, etc.,

W. H. WARD,
W. W. GUNTHER,
A. H. MCGEOCH,
D. A. W. DOWNIE.

Commercial Bank Chambers,
17 Bolton Street,
Newcastle.

May 23, 1957.

A "SILENT" STRANGULATED HERNIA.

SIR: I thought the following case might prove of interest to your readers, insomuch it provides a trap for the unwary.

Mrs. A., aged fifty-two years, a rather phlegmatic housewife from East Sydney, walked a half-mile or so to my surgery with the following history: dragging sensation in right groin since 1 p.m., April 17, 1957; lump in the right groin since this morning (April 18).

On examination, she was found to have a lump in the right inguinal region about one inch in diameter, which was rounded, firm, slightly nodular, and not attached to skin. The lump was very tender on palpation. She was sent to Sydney Hospital with a provisional diagnosis of strangulated femoral hernia. She was admitted for an emergency operation at 5.50 p.m. that day. On operation, this diagnosis was confirmed, and a right femoral herniorrhaphy was performed, together with the removal of a small lipoma in the inguinal canal. She fully recovered and was discharged eleven days later.

It is interesting to note that the physical findings were not at all characteristic of an early strangulated hernia,

with the following exception: the lump demonstrated a definite well-marked cough impulse.

My thanks are due to Dr. Rose, Superintendent of Sydney Hospital, for notes about her actual operation.

Yours, etc.,

115 Macleay Street,
Potts Point,
May 28, 1957.

NORMAN LEE.

GUIAICOL-GLYCEROL-ETHER: A TRANQUILLIZING DRUG.

SIR: Amongst the reports upon tranquillizing drugs, I have seen no mention of one which may have preceded chlorpromazine on the Australian market: guiaicol-glycerol-ether, a mild relaxant originally introduced in Germany as a complement to anæsthesia. The drug is commercially available for oral, parenteral and rectal administration.

A limited pilot trial carried out in 1954 upon a small group of psychotics gave promising results, but the controlled investigation planned to follow had to be abandoned. A later study by another worker using chlorpromazine on some of the same clinical material suggested to me that guiaicol-glycerol-ether was probably less effective than chlorpromazine, but still of use, and possibly preferable in selected cases.

In the last three years I have used the drug for psychoneurotic and psychosomatic illness, mainly as a physical aid to psychotherapy. I gained the impression that it had some value, especially for patients with raised nervous tension who could not attend frequently for psychotherapy. It appeared to be free from side-effects in the doses used (less than 2·0 grammes daily).

Clinical impressions, especially in such circumstances, are of no value in the accurate assessment of a drug. I should therefore be glad to learn whether any controlled investigations of this drug have been or will be carried out by those working in a wider field than myself.

Yours, etc.,

105 Commissioner Street,
Cooma,
New South Wales.
May 26, 1957.

DOUGLAS VANN.

Obituary.

WILLIAM EUGENE DOWNEY.

AIR VICE-MARSHAL E. A. DALEY has sent the following appreciation of the late Squadron Leader William Eugene Downey.

The late Squadron Leader W. E. Downey, who was killed in a service aircraft accident on April 29, 1957, graduated in medicine from the University of Melbourne in 1947, and was later a resident at Prince Henry's Hospital, Melbourne. His home was previously at Casterton, Victoria. He was a member of the Royal Australian Air Force Reserve and later joined the permanent service in 1952. He served abroad as medical officer with the Royal Australian Air Force squadrons in Malta, and demonstrated early his enthusiasm in the aviation medicine field, and in flying generally. He was attached to study at the Royal Air Force Institute of Aviation Medicine, Farnborough, England, in 1954, and on return to Australia became the Senior Medical Officer at the Royal Australian Air Force, Williamtown, New South Wales.

Downey became most proficient in high altitude chamber work, and kept abreast of principles and developments associated with pressure breathing and most other physiological problems associated with modern service and civilian flying. While at Williamtown he completed a paratroop course, making a number of jumps, and encouraged others to qualify similarly. He also greatly assisted the Survival School at Canungra, Queensland, acting as medical officer-instructor to certain Royal Australian Air Force and Army courses. He was particularly interested in jet aircraft, and was unfortunately killed, in company with a general duties officer, in a Meteor flight.

Downey was an energetic and stimulating worker in aviation medicine and amongst aircrew. He had an excellent way of explaining physiological problems and equipment to aircrew, medical officers and others, and was highly thought of by many who flew and were associated with him in this field. His death is a great loss to the Royal Australian Air Force and its Medical Service, but he died working in the environment he loved so well. Our sympathy goes out to his wife and children in their loss.

EDWARD SPENCER HOLLOWAY.

DR. EDWARD SPENCER HOLLOWAY, who died suddenly while visiting a patient on February 6, 1957, was the youngest son of John and Eliza Holloway, of "Mumbledoon" Station, Narrandera. His father was an Englishman, and his mother a direct descendant of Captain James Small, who came to Australia with Captain Phillip in 1788. His great-great-grandmother was the mother of the first white child born to free settlers in the colony. Dr. Holloway was educated at the Geelong College, Victoria, and subsequently qualified as a pharmacist. Soon afterwards he took up medicine at the University of Sydney, and graduated in 1913. He became a resident medical officer at the Royal Prince Alfred Hos-

pital, and at the Women's Hospital, Crown Street. During the first World War he travelled to England in 1915 and enlisted in the Royal Army Medical Corps. He served with the Queen's Royal West Surrey Regiment and later with the 26th Royal Fusiliers, and went to Cologne with the army of occupation. After demobilization and several years' post-graduate work in Great Britain and Europe, he returned to Australia in 1925 and commenced practice in the eastern suburbs of Sydney. He spent fourteen years at Maroubra Junction and eighteen years at Bellevue Hill, with interim trips abroad totalling two and a half years. While at Maroubra he was appointed the visiting medical officer to the State Penitentiary.

After building up a busy general practice Dr. Holloway gradually specialized in anæsthesia, and he was an honorary anæsthetist to the Eastern Suburbs Hospital from 1948. He was also a member of the honorary staff of the Royal Prince Alfred Hospital for ten years or more. As a contribution to the welfare of the profession generally he became a member of the Council of the New South Wales Medical Defence Union.

His hobbies were varied. He was a keen golfer and motorist. He had an extensive knowledge of music, and was particularly fond of the piano and organ. He spoke both German and French. Being mechanically minded and manually dexterous, he thoroughly enjoyed working a high precision lathe which he possessed, and which, rather sorrowfully, he handed over to the authorities during the last war. He was deeply interested in antique clocks, and over the years and while abroad acquired a unique and valuable collection, which owed its interest either to the fine workmanship of the old masters or to its historical

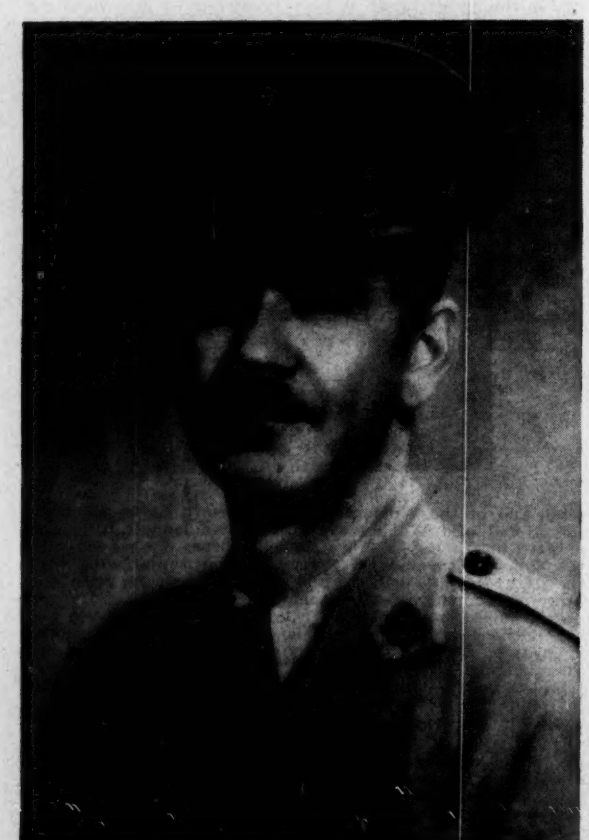
associations. Shortly before his death Dr. Holloway arranged, through Sir Herbert Schlink, to present to the Royal Prince Alfred Hospital a clock from the ship *Galatea*, which brought Prince Alfred to Australia in 1867, and a medallion which was struck to commemorate his visit. These two valuable antiques have since been installed in the Board Room of the hospital.

Dr. Holloway was not only a sound and competent practitioner, but was a gracious and generous friend who, in this way, contributed substantially to the helpful and kindly atmosphere which meant so much to his patients and to the staffs of the hospitals in which he worked. His friends and co-workers will greatly miss him, and deeply sympathize with his widow.

ROBERT GRANT.

We are indebted to Dr. Paul Hopkins for the following appreciation of the late Dr. Robert Grant.

Robert Grant died in Mackay on April 10, 1957. He was born in Mackay and was educated at the Townsville Grammar School, and from there he attended the University of Queensland, where he graduated as a bachelor of arts.



Robert commenced his medical course at the University of Sydney, but a scholarship and his Scottish leanings took him to Edinburgh to continue his course. While he was there, the first World War started, and he enlisted, finishing his course after the war. He worked in London for a time, then at the Royal Infirmary in Hull. In 1925 he obtained his Fellowship of the Royal College of Surgeons of Edinburgh.

He returned to Mackay, and entered a partnership with Dr. Stuart Kay. The latter retired soon after, and Robert Grant conducted the practice alone.

Robert Grant had a fine war service record. He enlisted as a student and went overseas with the Black Watch, and served in German East Africa from 1915 to 1919. In the second World War he enlisted full time in 1941; he served with the 11th Field Ambulance, and he was with this unit all through the Milne Bay action. After this campaign his age was telling, and he returned to be Deputy Assistant Director of Medical Services at Kelvin Grove in Brisbane, where his efficiency and willingness to help gained him many friends; he was discharged in 1945.

Robert Grant was very precise and efficient. He was beloved by his patients and respected by his fellow practitioners. Between wars he married Elspeth McIntosh, and they had two girls and one boy, all of whom are left to mourn his loss. His sports were fishing and golf. He had arranged to retire on June 30, 1957, and indulge his sports.

Robert Grant was a general practitioner of the best type; he was lovable, generous and efficient, and will be sadly missed in North Queensland.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes *et cetera* are promulgated in the *Commonwealth of Australia Gazette*, No. 22, of April 17, 1957.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

George Grahame Mahony and Richard Lippett are appointed Surgeon Lieutenants (for Short Service) (on probation), dated 27th December, 1956, and 25th January, 1957, respectively.

Confirmation in Rank.—Surgeon Lieutenant (for Short Service) (on probation) Joseph Raymond Clark is confirmed in the rank of Surgeon Lieutenant (for Short Service), with seniority in rank of 19th January, 1956.

Emergency List.

Appointment.—Surgeon Lieutenant John Dunn Campbell, Royal Navy (Emergency List), is appointed Surgeon Lieutenant, with seniority in rank of 4th August, 1951, dated 9th October, 1956.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

2/40188 Captain F. N. Dwyer is appointed from the Regular Army Special Reserve, Royal Australian Army Medical Corps (Medical), and to be Captain, 15th January, 1957.

Regular Army Special Reserve.

Royal Australian Army Medical Corps (Medical).

NX700474 Captain F. N. Dwyer is appointed to the Australian Regular Army, Royal Australian Army Medical Corps (Medical), 15th January, 1957.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 1st March, 1957: 1/39201 Ronald Leslie Thomson.

Southern Command.

Royal Australian Army Medical Corps (Medical).—The Regimental seniority of 4/31988 Captain R. A. Barter is in accordance with Army seniority (13th June, 1951). The provisional rank of 3/50198 Captain K. W. Mills is confirmed. 3/50198 Captain K. W. Mills is transferred to the Reserve of Officers (Royal Australian Army Medical Corps) (Medical) (Southern Command), 13th December, 1956.

Western Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 5th March, 1957: 5/26555 Frederick William Spencer Easton.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Western Command.—To be Honorary Captain, 1st March, 1957: Mortimer Edward Donovan.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

The notifications regarding the appointment of Michael John Seyfort (0312862) and Barrymore Walters (037263) to a short-service commission as approved in Executive Council Minutes No. 24 and 26 respectively of 1956, appearing in "Gazettes", No. 37, dated 5th July, 1956, and No. 40, dated 26th July, 1956, respectively, are withdrawn.

The following are appointed to a temporary commission, with the rank of Pilot Officer (Student): Michael John Seyfort (0312862), 15th March, 1956; Barrymore Walters (037263), 26th March, 1956; Tibor Thomas Pietzsch (0218354), 8th November, 1956.

The following officers are appointed to a permanent commission: Wing Commander H. T. Hardy (036451), 28th November, 1956; Flight Lieutenant R. W. Munson (0218089), 2nd October, 1956.

The resignation of the following Flight Lieutenants is accepted: D. N. Bennett (039747), 15th February, 1957; I. MacLachlan (0310756), 22nd February, 1957.

Medical Prizes.

THE AMERICAN DERMATOLOGICAL ASSOCIATION, INCORPORATED.

Annual Essay Contest.

THE American Dermatological Association is again offering a series of awards for the best essays submitted for original work, not previously published, relative to some fundamental aspect of dermatology or syphilology. The purpose of this contest is to stimulate investigators to original work in these fields. Cash awards will be presented as follows: $500, $400, $300 and $200 for first, second, third and fourth places respectively.

Manuscripts, typed in English with double spacing and ample margins as for publication, together with illustrations, charts and tables, all of which must be in quintuplet, are to be submitted not later than November 15, 1957.

The manuscripts should be sent to Dr. J. Lamar Callaway, Secretary, American Dermatological Association, Duke Hospital, Durham, North Carolina. Those which are incomplete in any of the foregoing respects will not be considered. Manuscripts should be limited to 10,000 words, or less, and the time of presentation of the winning essay shall not exceed thirty minutes. In order to aid fair judgement, papers should be submitted under a *nom de plume* with no information anywhere in the paper as to the institution or clinic where the work was done. Along with the paper by "John Smith", for example, a plain sealed envelope bearing the *nom de plume, plus* the full name and address of the author, is also submitted. Only after all the papers have been judged and returned to the chairman are the sealed envelopes opened and the winners known.

Competition in this contest is open to scientists generally, not exclusively to physicians.

The awards will be made by the Research Aid Committee of the American Dermatological Association, and its decision shall be final. The essays are judged on the following considerations: (i) originality of ideas; (ii) potential importance of the work; (iii) experimental methods and use of controls; (iv) evaluation of results; (v) clarity of presentation. This contest is planned as an annual one; but if in any year, at the discretion of the committee, no paper worthy of an award is offered, the awards may be omitted.

The results will be announced prior to January 1, 1958, and papers not winning an award become the author's property and will be returned promptly. Any paper which wins an award becomes the property of the American Dermatological Association.

The candidate winning first award may be invited to present his paper before the annual meeting of the American Dermatological Association with expenses paid, in addition to the $500 award. Further information regarding this essay contest may be obtained by writing to the Secretary of the American Dermatological Association.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Course in the Use of Radio-Isotopes in Medicine.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a week-end course in the use of radio-isotopes in medicine will be held at Saint Vincent's Hospital, Sydney, on Saturday, July 27, and at The Royal North Shore Hospital of Sydney on Sunday morning, July 28, 1957, under the supervision of Dr. Gordon C. Smith. By arrangement with the New South Wales State Cancer Council, the course will be free to all medical practitioners. It has been designed to provide basic elementary data about the physics and the diagnostic and therapeutic value of radio-isotopes in medicine. The programme will be as follows:

Saturday, July 27, in the students' lecture room, Saint Vincent's Hospital, Darlinghurst: 9.30 a.m., opening address, Professor C. R. Bickerton Blackburn; 10 a.m., "Radio-Isotopes: Definition, Detection and Assay", Dr. E. P. George; 10.45 a.m., discussion; 11.30 a.m., "Production and Procurement of Radio-Isotopes", Mr. D. J. Stevens; 12.15 p.m., discussion; 2 p.m., "Isotope Applications in Therapy", Dr H. J. Ham, Dr. L. Atkinson, Mr. B. W. Scott; 3 p.m., discussion; 3.30 p.m., "Investigative Use of Radiogold in Cancer of the Uterine Cervix", Dr. K. A. McGarrity, Dr. J. M. Garvan; 4.30 p.m., discussion.

Sunday, July 28, in the students' lecture room, The Royal North Shore Hospital of Sydney: 9.15 a.m., "Use of Radio-iodine in Thyroid Disease", Dr. F. F. Rundle, Dr. T. H. Oddie; 10.15 a.m., discussion; 10.45 a.m., "Uses of Radio-Isotopes in Hæmatology", Dr. C. K. Hambly, Dr. R. J. Walsh; 11.45 a.m., discussion; 12 noon, "Health Protection in the Use of Radio-Isotopes", Dr. G. C. Smith; 12.45 p.m., discussion.

It is important, in order that suitable catering facilities may be provided, that those wishing to participate should make formal application to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney (telephones BU 4497, BU 4498), from whom programmes may be obtained. The closing date for applications is Friday, July 5, 1957.

The College of Radiologists of Australasia.

THE THOMAS BAKER MEMORIAL FELLOWSHIP FOR RADIOLOGISTS.

THE Council of The College of Radiologists of Australasia has been empowered by the trustees of the Thomas Baker (Kodak), Alice Baker and Eleanor Shaw Benefactions to select a Fellow for a period of study abroad. The purpose of the Fellowship is to allow a qualified radiologist to further his knowledge by study in the United Kingdom. It is not intended that the Fellow should obtain further academic qualifications during the tenure of the Fellowship; but he may arrange to stay overseas for a further period for this purpose. The conditions are as follows:

1. The Fellow shall be a British subject, a graduate of a university in Australia or New Zealand, and should hold the Diploma of The College of Radiologists of Australasia or a recognized radiological diploma, and the possession of a higher medical degree will be an advantage.

2. The Fellowship may be awarded in either of two categories: (*a*) A qualified radiologist preferably of one or two years' standing. The tenure of the Fellowship shall be from twelve to eighteen months. The value of the Fellowship is £2000 (Australian). (*b*) A radiologist who has already

attained junior consultant status. The duration of appointment may be from six to eighteen months. The Fellowship would be at least £1000, but may be of the full amount available, depending upon the length of time spent overseas. The candidate would be expected to state his intention in regard to duration of stay abroad when making his application. Candidates shall indicate when making their application in which category they wish to be considered.

3. Preference will be given to applications made under category (*a*).

4. The Fellow must be prepared to take up the Fellowship and leave for overseas by July 1 of the following year after his election. He shall also give an undertaking that within two years of assuming the Fellowship he will return and engage in the practice of radiology in Australia or New Zealand for at least two years.

5. He shall furnish a report to the Council on his return.

6. The Fellow may elect to further his studies in either radiodiagnosis or radiotherapy.

Applications for this Fellowship must be made by the last day of August, 1957, to the Honorary Secretary, The College of Radiologists of Australasia, British Medical Association House, 135 Macquarie Street, Sydney, from whom application forms may be obtained.

FACULTY OF RADIOLOGISTS OF GREAT BRITAIN.

WE have been requested by the Honorary Secretary of The College of Radiologists of Australasia to publish the following information.

At the recent examination held in Sydney by the Faculty of Radiologists of Great Britain, eleven candidates presented themselves, of whom the following were successful: Dr. M. G. Pinner and Dr. W. S. C. Hare, of Victoria; Dr. M. D. Begley, of South Australia; Dr. K. S. Howatt and Dr. K. W. Mead, of Queensland.

Dr. D. G. Maitland, of Sydney, has been elected to Fellowship of the Faculty.

Research.

EXPERIMENTAL RESEARCH INTO PROBLEMS OF AGING.

THE trustees of the Ciba Foundation for the Promotion of International Co-operation in Medical and Chemical Research, wishing to encourage well-conceived research relevant to basic problems of aging, invite candidates to submit papers descriptive of work in the field for awards for 1958.

Copies of the regulations and form of application must be obtained from the Director before an entry is submitted, but in general candidates should note the following conditions: (*a*) Not less than five awards, of an average value of £300 each, are available for 1958. The announcement of awards will be made in July, 1958. (*b*) Entries must be received by the Director not later than January 1, 1958. (*c*) Entries will be judged by an international panel of distinguished scientists, including Professor C. H. Best (Toronto), Professor E. Braun-Menendez (Buenos Aires), Professor E. J. Conway (Dublin), Professor G. W. Corner (New York), Professor A. Haddow (London), Professor V. R. Khanolkar (Bombay), Professor R. Nicolaysen (Oslo), Dr. A. S. Parkes (London), Professor F. Verzár (Basle), and Professor F. G. Young (Cambridge). They will advise the Executive Council of the Foundation on their findings, and will also have power to recommend variation in the size and number of the awards according to the standard of entries. The decisions of the Executive Council will be final. (*d*) In the making of the awards, preference will be given to younger workers. (*e*) The papers may be in the candidate's own language. Papers should not be more than 7000 words in length, and in all cases a summary in English not exceeding in words 3% of the length of the paper must be attached. If possible, 10 copies of reprints in English should be provided. (*f*) Where there is one or more co-author, the name of the leading author should be indicated; it is to him that the award will normally be made, and it will be left to his discretion to share this award appropriately with his co-authors.

Copies of the regulations and form of application may be obtained from Dr. G. E. W. Wolstenholme, Director, and Secretary to the Executive Council, Ciba Foundation, 41 Portland Place, London, W.1, England.

Congresses.

WORLD CONGRESS OF GASTROENTEROLOGY.

THE World Congress of Gastroenterology and the 59th annual meeting of the American Gastroenterological Association will be held at the Sheraton Park Hotel, Washington, D.C., United States of America, from May 25 to 31, 1958. The subjects for discussion will be as follows: peptic ulcer; malabsorption and sprue-like syndromes; nutrition and its effects on the liver and pancreas; intestinal infections and infestations; cancer of the stomach: (i) epidemiological and experimental aspects, (ii) clinical aspects; original contributions (free papers). The Congress will enable visiting physicians and scientists to become better acquainted with medical institutions in the United States of America. It is hoped that some significant factors in pathogenesis and in the life history of certain disease states may be disclosed.

Full particulars of the Congress, information about hotel reservations, fees, presentation of papers, travel grants *et cetera* may be obtained from Dr. H. M. Pollard, Secretary-General of the Congress, University Hospital, Ann Arbor, Michigan, United States of America.

Notice.

Q.T. AUSTRALIA.

IN Melbourne, on May 18, 1957, more than 40 people with ileostomies formed a mutual aid group. It was decided to call the group "Q.T. Australia", the name "Q.T." being that selected by the original group in America and formed from the initials of the two wards in the Mount Sinai Hospital, New York, of which most of the members were patients. The name has subsequently been adopted by other ileostomy groups in America and in Great Britain. There are now over 1500 members in the various groups.

The objects of the group are to help members in the management of ileostomies by means of lectures, demonstrations and newsletters. It is hoped that members may be of assistance to those about to undergo operation and to those who have recently had the operation.

Further information regarding membership, future meetings *et cetera* will be gladly supplied by the Honorary Secretaries, Mrs. B. E. Reid, 12 Marchant Avenue, Reservoir (telephone JM 1482), and Mrs. H. Johnson, 508 Waterdale Road, West Heidelberg (telephone JL 4113).

The Royal Australasian College of Physicians.

WUNDERLY TRAVELLING SCHOLARSHIP IN THORACIC DISEASE.

APPLICATIONS are invited for the award of a Wunderly Travelling Scholarship in Thoracic Disease for the year 1958.

The purpose of the foundation is the post-graduate education and training abroad in the diagnosis and management of thoracic disease of young physicians who may not otherwise have the opportunity of proceeding overseas for such training. The value of the scholarship for 1958 is £1000 Australian currency. The scholarship is tenable by a graduate in medicine of a university approved by the College, who holds a doctorate of medicine and/or a Fellowship or Membership of The Royal Australasian College of Physicians or of the Royal College of Physicians of London; but the holding of a higher degree or diploma is not an absolute condition of the award. No further awards of scholarships will be available under the Wunderly Foundation.

Full details of the conditions of award of this scholarship and forms of application may be obtained from the Honorary Secretary, 145 Macquarie Street, Sydney. The closing date for the receipt of applications for this scholarship is Thursday, August 15, 1957.

GRANTS FOR MEDICAL RESEARCH.

APPLICATIONS are invited for grants from the research fund of the College for the year 1958. Two types of grants will be considered: (i) grants-in-aid to institutions for a specific project by one research worker; (ii) research fellowships, designed to encourage young men to undertake whole-time research work in the field of clinical medicine. Applications should be lodged with the Honorary Secretary of the College, 145 Macquarie Street, Sydney, not later than September 1, 1957.

Royal Australasian College of Surgeons.

FINAL FELLOWSHIP EXAMINATION.

THE next meeting of the Court of Examiners for the final examination for Fellowship of the Royal Australasian College of Surgeons will be held in Melbourne beginning on Friday, October 18, 1957.

Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so before September 5, 1957. The appropriate forms are available from the Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1.

Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented for the examination, may present at this examination provided they notify the Secretary of their intention to do so by September 5, 1957. It is stressed that entries close on this date, and that late entries cannot be accepted. The examination fee is £26 5s. *plus* exchange on cheques drawn on banks outside Melbourne, and must be paid to the Secretary by September 5, 1957.

The examination will be conducted in general surgery, and in the special branches of ophthalmology, laryngo-otology, gynæcology and operative obstetrics, orthopædics, urology, neurosurgery, plastic surgery, thoracic surgery and pædiatric surgery.

At its meeting held on June 23 and 24, 1956, the Council decided that until December 31, 1958, Fellows of other Colleges with which the Royal Australasian College of Surgeons has reciprocity of primary examinations, who obtained their Fellowship prior to January 1, 1950, may, at the discretion of the Council, be permitted to undergo a modified type of final examination. The conditions set out above regarding method of application for permission to present, date on which entries close, examination fee *et cetera* also apply to the temporary modified type of final examination.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales in accordance with the *Medical Practitioners Act*, 1938-1957:

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (1) (*a*) of the Act: Bradley, Joan Penelope, M.B., B.S., 1955 (Univ. Melbourne).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (*b*) of the Act: Leitch, Austen Harding, M.B., B.Ch., 1950 (Univ. Witwatersrand); Mullany, Michael John,

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MAY 18, 1957.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	..	6(5)	5(2)	..	..	..	1	..	12
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	4	..	3(1)	..	..	..	..	..	7
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	2	..	..	..	..	..	..	..	2
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	2(1)	..	..	..	..	..	..	2
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	..	10(9)	1(1)	..	..	..	..	1	12
Diphtheria	5(5)	..	..	..	..	1	..	..	6
Dysentery (Bacillary)	..	2(2)	1(1)	1	..	..	..	..	4
Encephalitis	..	1(1)	..	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	39(20)	21(7)	..	3(1)	2(2)	5(2)	..	..	70
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	7	..	1	..	8
Leptospirosis	..	..	5	..	..	..	..	..	5
Malaria	..	2(2)	..	..	..	..	5	..	7
Meningococcal Infection	1	..	1	..	..	..	..	..	2
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	4(1)	..	2	..	..	..	..	..	6
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	36(29)	..	9(4)	1	..	..	..	46
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	11(6)	19(11)	4(2)	19(13)	5(9)	1(1)	..	..	68
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	1(1)	1	..	..	1(1)	1	..	4
Trachoma	..	..	..	..	..	..	1	..	1
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	26(19)	27(18)	10(3)	4(2)	13(8)	6(1)	..	..	86
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	2	..	..	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

M.B., B.Ch., 1954 (National Univ., Ireland); Stok, Michael, L.R.C.P., L.R.C.S. (Edinburgh), L.R.F.P. & S. (Glasgow), 1949; Waterlow, William Gordon, M.B., Ch.B., 1953 (Univ. Sheffield).

Registered medical practitioners who are required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3) and are registered under Section 17 (1) (*a*) of the Act: Prime, Thomas Trenfield, M.B., B.S., 1957 (Univ. Melbourne); Tippett, George Henry King, M.B., B.S., 1957 (Univ. Melbourne).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (*a*) of the Act: Beischer, Norman Albert, M.B., B.S., 1954 (Univ. Melbourne); Brady, Keith Ferguson, M.B., B.S., 1951 (Univ. Queensland); Cilento, Raphael Charles Frederic, M.B., B.S., 1944 (Univ. Queensland).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (*b*): Blaxland, Peter John, M.B., B.S., 1946 (Univ. London), F.R.C.S., 1948 (England); Campbell, John Dunn, M.B., Ch.B., 1949 (Univ. Edinburgh); Humphries, Sydney Vernon, M.R.C.S. (England), L.R.C.P. (London), 1932.

TASMANIA.

THE following have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners: McKay, Albert Leslie, M.B., B.S., 1956 (Univ. Sydney); Hosking, Alan Thomas, M.B., B.S., 1955 (Univ. Sydney); Rodrique, Roger Brian, M.B., B.S., 1956 (Univ. Melbourne); Lai, Min Tet, M.B., B.S., 1955 (Univ. Sydney); Laister, William Joseph, M.B., B.S., 1954 (Univ. Queensland); Walshe, Annette, M.B., B.S., 1956 (Univ. Sydney); Speechley, Ronald Alwyn, M.B., B.S., 1956 (Univ. Sydney); Brick, Douglas Lawton, M.B., Ch.B., 1951 (Univ. Leeds); Beare, Donal Barry O'Sullivan, M.B., B.Ch., B.A.O., 1927 (Dublin); Gault, Ian David, M.B., B.S., 1957 (Univ. Melbourne); Yates, Laurence Anthony, M.B., B.S., 1956 (Univ. Adelaide); Hamilton, Peter Archibald Robb, M.B., B.S., 1955 (Univ. Melbourne); Pugh, Stephen Ian, M.B., Ch.B., 1941 (Univ. Edinburgh); Malcolm, Susanne, M.B., B.S., 1956 (Univ. Sydney).

Medical Appointments.

Dr. T. W. Murray has been appointed Deputy Superintendent of the Mental Hospital, Sunbury, Victoria.

Dr. R. N. Ibbotson and Dr. R. Meadows have been appointed Assistant Clinical Pathologists at the Institute of Medical and Veterinary Science, Adelaide.

Dr. W. B. Grant has been appointed Medical Officer on probation to the Division of Mental Hygiene, Department of Public Health, New South Wales.

Dr. R. D. Hammill has been appointed a member of the Medical Board, Port Pirie, pursuant to the *Workmen's Compensation Act*, 1932-1956, of South Australia.

The following have been appointed to be a Panel of Medical Officers for Port Pirie, pursuant to Section 97 (*a*) of the *Workmen's Compensation Act*, 1932-1956, of South Australia: Dr. E. McLaughlin, Dr. G. A. Lendon, Dr. K. S. Hetzel, Dr. F. R. Hone, Dr. M. E. Chinner, Dr. J. L. Hayward.

Dr. R. S. Steel, Dr. A. W. J. Bulteau and Dr. A. R. Hazelton have been appointed members of the New South Wales Ambulance Transport Service Board.

Dr. N. T. Yeomans has been appointed Medical Officer to the Division of Mental Hygiene, Department of Public Health, New South Wales.

Nominations and Elections.

THE undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Au, Raymond Daniel Che-Kaung, M.B., B.S., 1957 (Univ. Sydney); Burchett, Peter Martin, M.B., B.S., 1957 (Univ. Sydney); Jones, Anthony Charles, M.B., B.S., 1951 (Univ. Sydney); Stylis, Stanley Chris, M.B., B.S., 1956 (Univ. Sydney); Gillies, Malcolm John, M.B., B.S., 1955 (Univ. Sydney); Phipps, Gilbert William, M.B., B.Ch., 1955 (Univ. Cambridge); Kronenberg, Harry, M.B., B.S., 1952 (Univ. Sydney); Dabrowski, Edward, registered in accordance with the provisions of Section 17 (2) of the *Medical Practitioners Act*, 1938-1957; Nowak, Jan Teodor, registered in accordance with the provisions of Section 17 (1) (*c*) of the *Medical Practitioners Act*, 1938-1957; Shuhevych, Ivan, registered in accordance with the provisions of Section 17 (1) (*c*) of the *Medical Practitioners Act*, 1938-1957; Vince, Stephan, registered in accordance with the provisions of Section 21 (3) of the *Medical Practitioners Act*, 1938-1957; Wouters, Labora Marianne, licensed in accordance with the provisions of Section 21 (*b*) of the *Medical Practitioners Act*, 1938-1957.

Deaths.

THE following deaths have been announced:

BOURNE.—Eleanor Elizabeth Bourne, on May 23, 1957, at Brisbane.

SPEARMAN.—Horace Layton Spearman, on May 26, 1957, at Sydney.

LUDOWICI.—Edward Ludowici, on May 26, 1957, at Bellevue Hill, New South Wales.

Diary for the Month.

JUNE 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 14.—Tasmanian Branch, B.M.A.: Branch Council.
JUNE 14.—Queensland Branch, B.M.A.: Council Meeting.
JUNE 17.—Victorian Branch, B.M.A.: Finance Subcommittee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 88 L'Estrange Terrace, Kelvin Grove, Brisbane): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

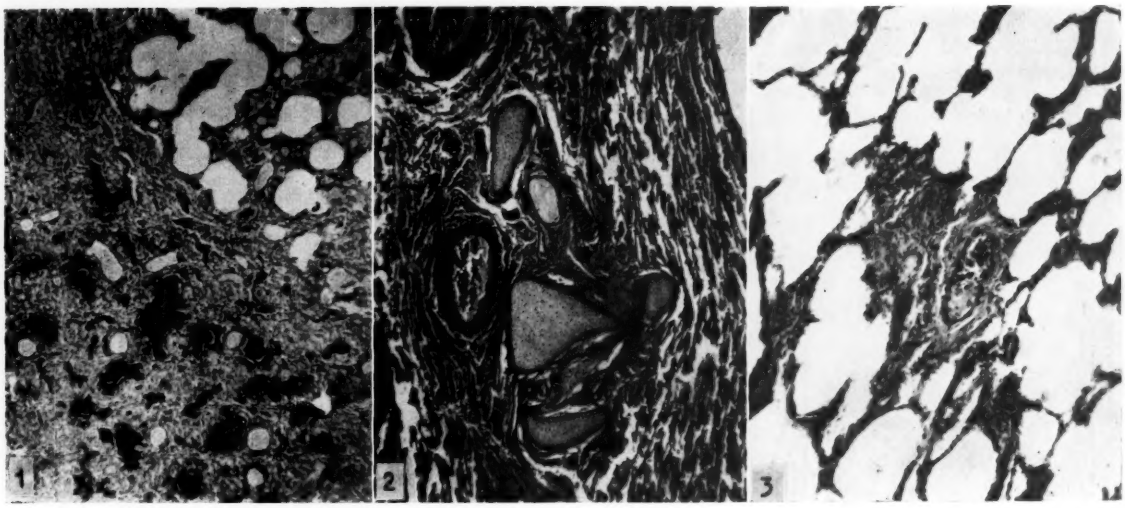
MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

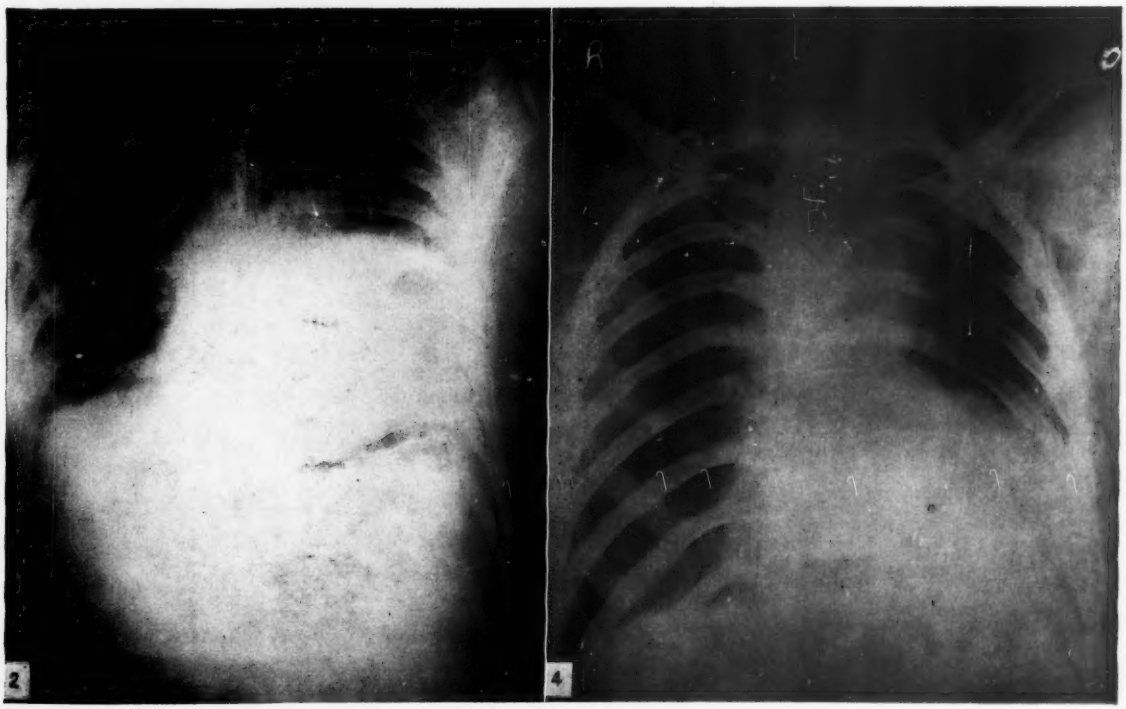
Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 *per annum* within America and foreign countries, payable in advance.

ILLUSTRATIONS TO THE ARTICLE BY ALAN WILLIAMS.



ILLUSTRATIONS TO THE ARTICLE BY HARRY M. WINDSOR AND ROSS M. DUNN.



ILLUSTRATIONS TO THE ARTICLE BY THOMAS FERRIER, M.B., B.S., M.R.A.C.P., AND NEVILLE DAVIS, M.B., B.S., F.R.C.S.

FIGURE I.

FIGURE II.

FIGURE III.

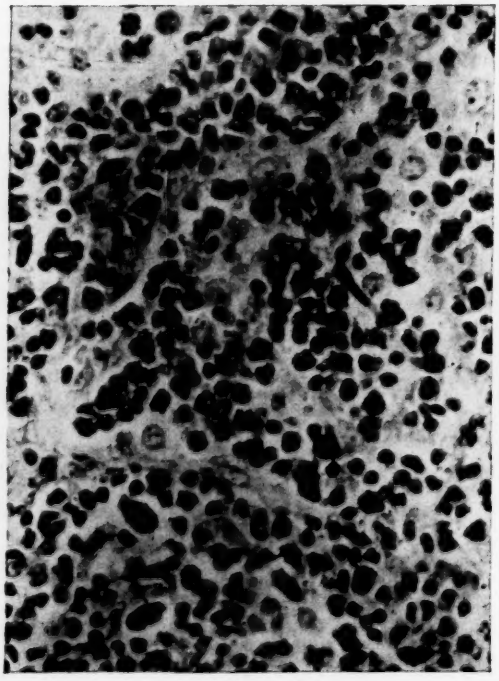
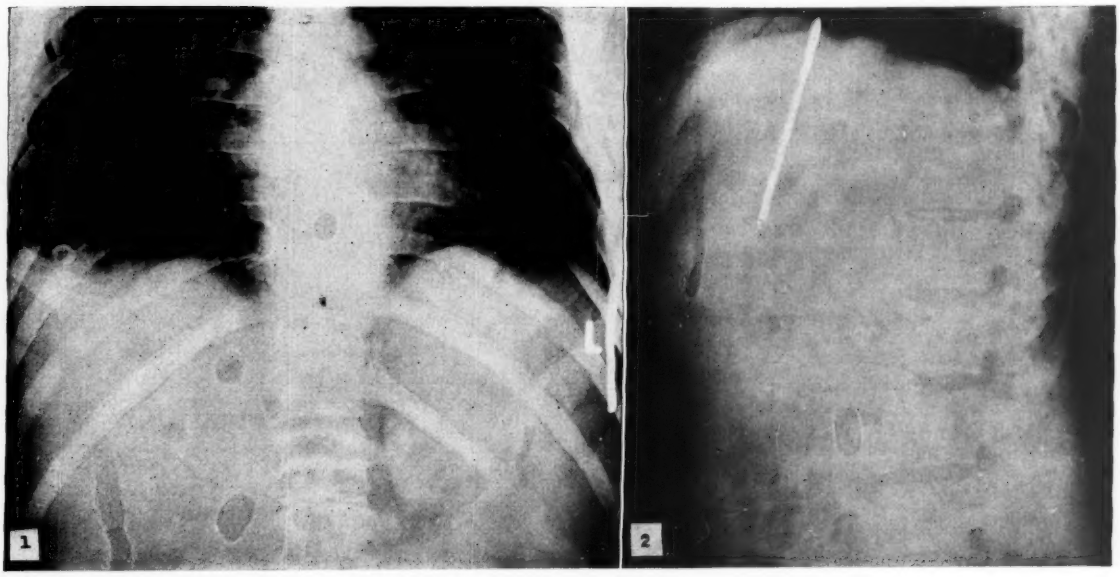


FIGURE IV.

ILLUSTRATIONS TO THE ARTICLE BY ERIC M. FISHER.



ILLUSTRATIONS TO THE ARTICLE BY A. R. H. DUGGAN.

FIGURE II.

Showing a diffuse sheet of cells with small round nuclei and no visible cytoplasm. (Low-power view, × 100 approximately.)

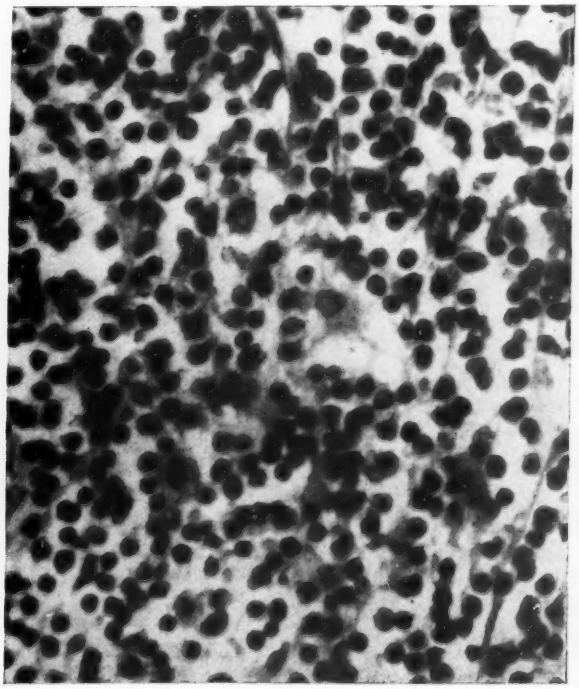
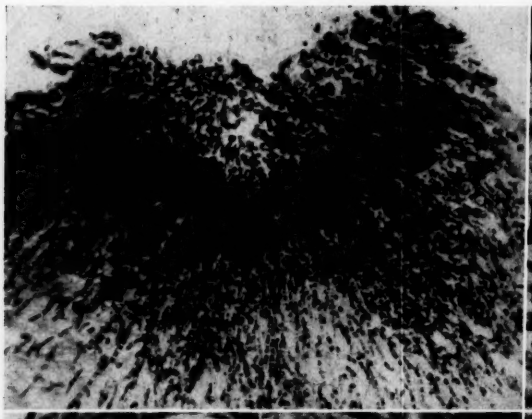


FIGURE III.

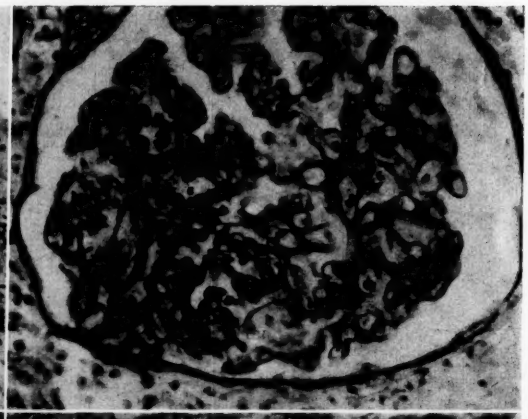
Showing cells with round, darkly staining nuclei and little or no visible cytoplasm. Near the centre of the field there is a cell with abundant cytoplasm from which irregular processes project. These cells may be histiocytes or reticulum cells, and can be found scattered throughout the tumours. (High-power view, × 500 approximately.)

ILLUSTRATIONS TO THE ARTICLE BY N. J. NICOLAIDES.

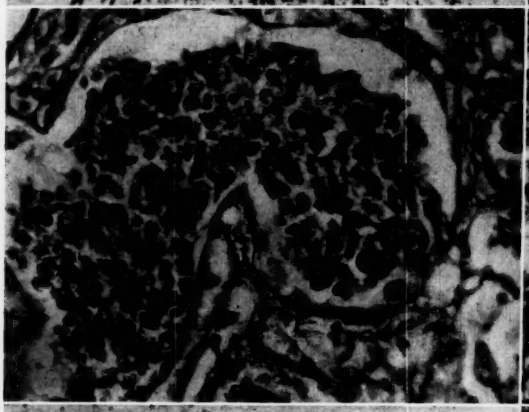
3



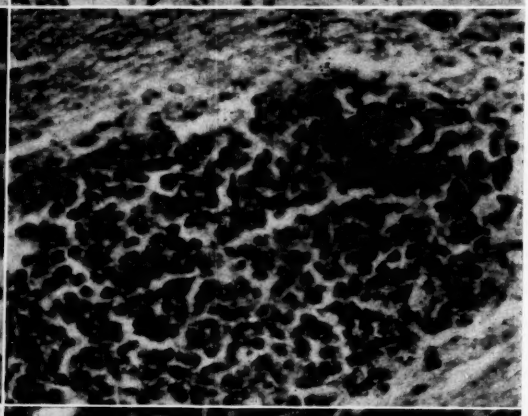
4



5



6



7

8